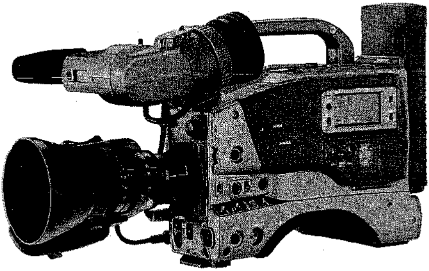
VIDE-V27525

JVC

SERVICE MANUAL

DV CAMCORDER

GY-DV500U/GY-DV500E



The photo shows the GY-DV500 DV camcorder with an optional lens and viewfinder.

Mini DV

PROFESSIONAL DV

No. 60125
November 1999

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts.
   Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

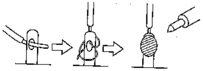


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

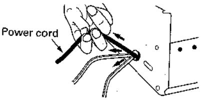


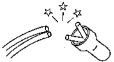
Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number :** E03830-001
    2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).



cut close to connector

Fig.3

       (2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

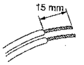


Fig.4

       (3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

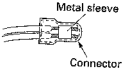


Fig.5

       (4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

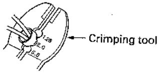


Fig.6

       (5) Check the four points noted in Fig.7.

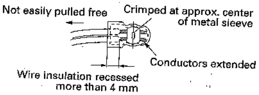

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

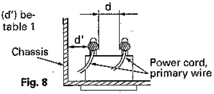


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method : (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

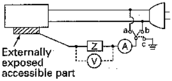


Fig. 9

5. **Grounding (Class Ⅰ model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

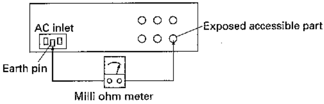


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 miute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 µF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

PrecautionsForUseoftheDVConnector

- Be sure to follow the procedure outlined below when connecting.
  1. **Turn ON the GY-DV500 and the equipment to be connected.**
  2. **Set the VCR Setup Menu item No. 126 INPUT SELECT.**
  3. **Insert the videocassette.**
  4. **Connect the DV cable.**

  (If the procedure is performed in incorrect order, noise may appear in the recording and playback picture and the sound may fall out. If this occurs, disconnect the DV cable and then connect it again following steps 1 to 4 of the above procedure.)
- When recording the GY-DV500 playback picture using another component with DV connector, such as a non-linear editing controller, be sure to set the VCR Setup Menu item No. 126 INPUT SELECT to **IEEE1394**.

  (If the INPUT SELECT item is set to CAMERA, be sure to perform steps 1 to 4 of the above procedure.)
- When making a backup recording on another component via the DV connector while recording with the GY-DV500, be sure to set the VCR Setup Menu item No. 126 INPUT SELECT to **CAMERA**.

  (If the INPUT SELECT item is set to IEEE1394, be sure to perform steps 1 to 4 of the above procedure.)

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Precautions for Use of Head Cleaning Tape

Adhere to the following precautions when using the head cleaning tape.

1. The tape runs for 10 seconds at a time in the PLAY mode. (The tape stops automatically and then the unit enters the SAVE MODE. However, the display back light is not turned off.) Press the PLAY button after the cleaning tape is fully loaded.
2. Do not use the tape more than four times at the most for each cleaning.
3. The cleaning tape can be used four times. One time: One tape transport from the start of the rewound tape to the end of the tape.

- Use the following chart as a guide for periodical head cleaning.

Operating environment	Low temperature 0°C to 10°C	Room temperature 10°C to 35°C	High temperature 35°C to 40°C
Yardstick for use of cleaning tape	1 to 2 times every 5 hours	1 to 2 times every 20 to 30 hours	1 to 2 times every 5 hours

Note 1) When used in a low humidity environment (10% RH to 30% RH), head cleaning should be conducted at intervals half of those given in the above chart.

Note 2) When an ME80 tape is used immediately after head cleaning, the VTR warning (head) indicator may remain on. In this case, let the tape run as the indicator will turn off after the tape has run for a while.

Note 3) Use the cleaning tape in the room temperature (10°C to 35°C).

SC96934-001

Precautions when writing S.S.F. data

When S.S.F. data stored in the memory of the GY-DV500 is written to the beginning of the rewound tape, approximately 5 seconds of recorded video and/or sound will be erased at the beginning.
In the case of important recordings, leave 5 seconds or more of the tape unrecorded before starting recording.

JVC®

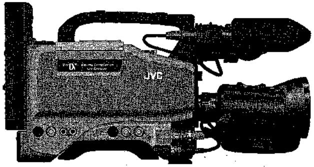
DV CAMCORDER

GY-DV500

Mini DV

INSTRUCTIONS

INTRODUCTION
CONTROLS, INDICATORS AND CONNECTORS
BASIC SYSTEM CONNECTIONS AND ADJUSTMENTS
POWER SUPPLY
PREPARATIONS
SETTING AND ADJUSTMENTS BEFORE SHOOTING
SHOOTING OPERATION
PLAYBACK MODE
TIME CODE OPERATION
S.S.F (Super Scene Finder)
USING EXTERNAL COMPONENTS
SETUP MENU
FEATURES OF THE CAMERA SECTION
OTHERS



* The illustration shows the GY-DV500 DV Camcorder with the optional lens viewfinder attached.

Thank you for purchasing this JVC product. Before operating this unit, please read the Instructions carefully to ensure the best possible performance.

For Customer Use :
Enter below the Serial No. which is located on the body.
Retain this information for future reference.

Model No. GY-DV500

Serial No.

This Instructions attached to service manual is different from that which is provided the GY-DV500.

This instruction manual is made from 100% recycled paper.

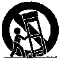
SC96874 : U-ver.
SC96875 : E-ver.

IMPORTANT SAFEGUARDS

U-ver. only

1. Read all of these instructions.
2. Save these instructions for later use.
3. All warnings on the product and in the operating instructions should be adhered to.
4. Unplug this appliance system from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
5. Do not use attachments not recommended by the appliance manufacturer as they may cause hazards.
6. Do not use this appliance near water – for example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, etc.
7. Do not place this appliance on an unstable cart, stand, or table. The appliance may fall, causing serious injury to a child or adult, and serious damage to the appliance.
   Use only with a cart or stand recommended by the manufacturer, or sold with the appliance. Wall or shelf mounting should follow the manufacturer's instructions, and should use a mounting kit approved by the manufacturer.
   An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
8. Slots and openings in the cabinet and the back or bottom are provided for ventilation, and to insure reliable operation of the appliance and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the appliance on a bed, sofa, rug, or other similar surface. This appliance should never be placed near or over a radiator or heat register. This appliance should not be placed in a built-in installation such as a bookcase unless proper ventilation is provided.
9. This appliance should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your dealer or local power company. For appliance designed to operate from battery power, refer to the operating instructions.
10. This appliance system is equipped with a 3-wire grounding type plug (a plug having a third (grounding) pin). This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding plug.
11. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.
12. Do not allow anything to rest on the power cord. Do not locate this appliance where the cord will be abused by persons walking on it.
13. Follow all warnings and instructions marked on the appliance.
14. Do not overload wall outlets and extension cords as this can result in fire or electric shock.
15. Never push objects of any kind into this appliance through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the appliance.
16. Do not attempt to service this appliance yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
17. Unplug this appliance from the wall outlet and refer servicing to qualified service personnel under the following conditions:
   a. When the power cord or plug is damaged or frayed.
   b. If liquid has been spilled into the appliance.
   c. If the appliance has been exposed to rain or water.
   d. If the appliance does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the appliance to normal operation.
   e. If the appliance has been dropped or the cabinet has been damaged.
   f. When the appliance exhibits a distinct change in performance – this indicates a need for service.
18. When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.
19. Upon completion of any service or repairs to this appliance, ask the service technician to perform routine safety checks to determine that the appliance is in safe operating condition.

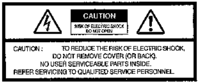
PORTABLE CART WARNING
(symbol provided by RETAC)



S3126A

SAFETY PRECAUTIONS

FOR USA AND CANADA



CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INFORMATION FOR USA

INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION

CHANGES OR MODIFICATIONS NOT APPROVED BY JVC COULD VOID USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS : (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION

INFORMATION (FOR CANADA)
RENSEIGNEMENT (POUR CANADA)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Class B est conforme à la norme NMB-003 du Canada.

WARNING:
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
This unit should be used with 12V DC only.
CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

NOTE:
The rating plate (serial number plate) is on the top frame.

CAUTION
To prevent electric shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified service personnel.

AVERTISSEMENT :
POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, NE PAS EXPOSER L'APPAREIL A L'HUMIDITE OU A LA PLUIE.
Ce magnétoscope ne doit être utilisé que sur du courant direct en 12V.
ATTENTION :
Afin d'eviter tout resque d'incendie ou d'électrocution, ne pas utiliser d'autres sources d'alimentation électrique.

REMARQUE :
La plaque d'identification (numéro de série) se trouve sur le panneau arrière de l'appareil.

WARNING ON LITHIUM BATTERY
The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, heat avobe 100°C (212°F) or incinerate.
Replace battery with Matsushita Electric CR2032, use of another battery may present a risk of fire or explosion.
- Dispose of used battery promptly.
- Keep away from children.
- Do not disassemble and do not dispose of in fire.

For Sweden

VARNING
Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

For Norway

ADVARSEL
Lithiumbatteri–Eksplosjonsfare.
Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanteln.
Brukt batteri returneres apparatleverandøren.

For Denmark

ADVARSEL!
Lithiumbatteri–Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Lever det brugte batteri tilbage til leverandøren.

For Finland

VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

Thank you for purchasing the DV Camcorder GY-DV500.

This unit is a MiniDV video system format camcorder. Videocassettes which are not marked with the MiniDV symbol cannot be used with this unit.

The following phenomena may occur when tapes recorded on other units (including another GY-DV500) are recorded or played back on this camcorder.

- The transient section between scenes recorded on other units and those recorded on this unit may appear disturbed.
- Digital noise may appear during playback due to tracking errors.

- This unit records and plays back in the SP mode. Recording or playback in the LP mode is not possible.
- In the case of important recordings, do not record within the first 2 to 3 minutes from the beginning of the tape.
- Before recording important scenes, be sure to perform a test recording and confirm that both video and audio are recorded correctly.
- Recorded video and audio contents are for private use. Other use may infringe on the rights of copyright holders.
- JVC cannot assume liabilities that may derive from the impossibility of normal recording or playback of video or audio due to malfunction of the camcorder or the videocassette.

MAIN FEATURES

- Compact, lightweight design
  Employment of magnesium die cast has resulted in an operation-condition weight as low as approximately 5 kg including lens, viewfinder, battery, and cassette.
- DV high-quality digital format
  The 4:1:1 (U-ver.), 4:2:0 (E-ver.), 8-bit, 25 Mbps component digital processing of the format ensures recording and playback with high picture quality.
- High sound quality thanks to PCM audio
  Two types of sampling, 16-bit, 48 kHz sampling and 12-bit, 32 kHz sampling, ensure high-quality digital audio.
- Concentrated LCD display (back-lit)
  The concentrated LCD panel shows the time code and CTL counter, tape remaining time, remaining battery power, audio levels, VCR section setup menus, hour meter data, and a variety of warning indications. The display is back-lit to facilitate viewing in dark locations.
- Time code reader/generator
  The built-in time code reader/generator can be used to record SMPTE (U-ver.), EBU (E-ver.) time code and user's bits.
- AEF (Automatic Edit Function) enables neat switching between recorded scenes.
- Built-in monitor loudspeaker for audio checking
  The input audio can be monitored in recording or EE mode. The playback sound can be monitored in the playback mode. The loudspeaker also outputs an alarm tone in case an abnormal condition occurs in the unit.
- Rec check function for convenient recording review
- Camera section designed with 3-CCD system for high-quality picture
  Three 1/2" CCDs with 380,000 (U-ver.), 440,000 (E-ver.) effective pixels employed. Digital signal processing for reproduction of DV high-quality picture.
- Super sensitivity F/11, 2000 lux
  2000 lx standard sensitivity increased to F/11 while high S/N is retained. Enables shooting at normal indoor illumination eliminating the need for extra illumination.
- LOLUX for 0.75 lux (F1.4) illumination
  Employment of LOLUX mode ensures +33 dB gain. This is ideal for difficult shooting conditions with almost no illumination.
- Multi-Zone Auto Iris Detection Circuit
  Multi-zone auto iris detection circuit ensures optimum iris position even in backlit conditions or when a bright subject moves in a frame. Switch provided for selecting over or under level.
- Safety Zone indication in viewfinder
  Three types of safety zone indicator functions provided.
- Zebra pattern video level indication in viewfinder
- Full Auto Shooting (FAS) function
  Eliminating the need for troublesome switch or filter operations, the FAS function automatically provides a wide range of compatibility with shooting conditions which varies as you move between indoors and outdoors or between bright and dark locations.
- Color temperature conversion filters for "3200K", "5600K", "5600 K + ND" provided.
- Variable scan shutter for U-ver.
  Eliminates flicker when shooting other screen pictures than NTSC, such as computer monitor screens.
  Copes with the range from 60.1 Hz to 2084.6 Hz.
- Variable scan shutter for E-ver.
  Eliminates flicker when shooting other screen pictures than PAL, such as computer monitor screens.
  Copes with the range from 50.1 Hz to 2067.8 Hz.
- DV (i. LINK) connector
  DV connector (4-pin) provided. Enables transfer of digital data to other equipment provided with DV connector, such as a non-linear editing controller.
- S.S.F. (Super Scene Finder) function
  Enables memorization of the start point and ending point of each scene or memorization of CUE points.
- 1/2" bayonet type lens
- Camera output, VCR playback output (composite/YC) possible
- External sync input connector
- Built-in color bar (SMPTE type for U-ver., EBU type for E-ver.)
- Superior operability with shutter speed and menus selected by dial.

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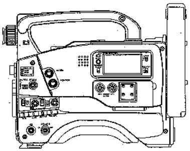
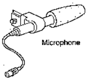
1. INTRODUCTION

1-1 Main Unit Configuration

The GY-DV500 configuration is as shown below.



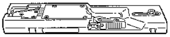
Camcorder (GY-DV500)



Microphone

Lithium battery

Head cleaning tape



Tripod base

CAUTION :

- The front base mount may be locked while the pin of the tripod base is not inserted into the hole on the rear base mount of the unit. Therefore, after mounting, make sure that these parts are engaged properly.
- When moving the GY-DV500 mounted on a tripod, any impact or vibration should be avoided as this may cause the unit to become detached and to drop from the tripod. Be sure to remove the unit from the tripod before transporting it.

1-2 Precautions for Proper Use

- Supply voltage
  Make sure that the power is between 11 V and 15 V DC. If the power voltage is too low, abnormal color and increased noise may occur. Do not exceed 15 V DC in any case, or the unit could be damaged.
- Allowable ambient temperature and humidity
  Be sure to use the unit within the allowable temperature range of 0°C to 40°C and a relative humidity of 30% to 80%. Using the unit at a temperature or humidity outside the allowable ranges could result not only in malfunction but the impact on the CCD elements could be serious as small white spots may be generated. When storing the GY-DV500 for a long time, the storage temperatures should be -20°C to 60°C.
- Strong electromagnetic waves or magnetism
  Where there are strong electromagnetic waves or magnetism, for example near a radio or TV transmitter, transformer, motor, etc., the picture may contain noise and the colors may be incorrect.
- Use of wireless microphone near the camera
  When a wireless microphone or wireless microphone tuner is used near the camera during recording, the tuner could pick up noise.
- Avoid using or placing the unit in places;
  - subject to extreme heat or cold;
  - with excessive dirt or dust;
  - with high humidity or moisture;
  - subject to smoke or vapour such as near a cooking stove;
  - subject to strong vibrations or on an unstable surface.
  - also do not leave the unit for long hours in a parked car under direct sunlight or near room heating equipment.
- Protect the unit from being splashed with water (especially when shooting in the rain).
- Protect the unit from being wet when shooting on a beach. In addition, salt and sand may adhere to the camera body. Be sure to clean the camera after use.
- Protect the unit against penetration of dust when using it in a place subject to sandy dust.
- Optical performance of lens
  Due to the optical performance of the lens, color divergence phenomena (magnification chromatic aberration) may occur at the periphery of the image. This is not a camera malfunction.
- Noise may appear in the viewfinder when switching between the playback picture and the EE picture.
- Setup level (NTSC only)
  The video signal of the unit's video output is provided with a setup level when shipped from the factory. If you want to turn OFF the setup level, please consult the person in charge of professional video equipment at your nearest JVC-authorized service agent. The setup level is never attached to the video signal recorded on the tape.
- Use the unit in an upright position.
  If placed on its side, heat release efficiency will deteriorate, adversely affecting the tape transport. Depending on circumstances the tape may also be damaged.
- Vibrations
  Colors may fail to appear during VCR playback in locations subjected to vibrations.
- Precautions for transportation
  Do not drop or hit the unit against a hard object.
- Remove the videocassette before transporting the unit.
- Do not insert an object other than a videocassette in the cassette insertion slot. Be sure to close the cassette cover when the unit is not to be used for a long period
- Do not set the POWER switch to OFF or remove the power cable during recording or playback. Otherwise the tape may be damaged.
- When the unit is not in use, be sure to set the POWER switch to OFF in order to reduce power consumption.
- Cleaning the body: Wipe body with a dry, soft cloth. When it is extremely dirty, soak the cloth in a solution of neutral detergent, wring it out and then wipe. To prevent deformation of the body, etc. and to avoid operation hazards, do not allow volatile liquids such as benzine and thinner to touch the body, and do not wipe it with a cloth soaked in such a liquid.
- The camera may be unstable in the period immediately after the power is turned on, but this is not a malfunction.
- If a tape containing recorded PAL signals is played back, the GY-DV500 automatically enters the STOP mode. If this happens, remove the videocassette so that the unit returns to its normal state. (U-ver.)
- If a tape containing recorded NTSC signals is played back, the GY-DV500 automatically enters the STOP mode. If this happens, remove the videocassette so that the unit returns to its normal state. (E-ver.)

CAUTION :

- Do not point the lens or viewfinder directly at the sun or other strong light source.
  - Eye damage could result.
  - If the lens or viewfinder is left pointed at the sun, rays may collect inside the unit and cause damage or a fire.
- When carrying the camera, be sure to hold the carrying handle. Holding the lens or viewfinder may result in damage.

1-3 Routine and Periodical Maintenance

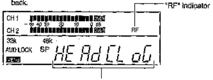
The GY-DV500 incorporates precision mechanical parts, which will collect dirt, wear out and deteriorate as the unit is used. On the other hand, when the unit has been used for a long period in a normal environment, the heads, drums and tape transport mechanisms also collect dirt deposited on them. Furthermore, dust which penetrates the inside of the VCR section especially during outdoor use will promote the wear and deterioration of mechanical parts by causing poor contact between tape and heads or failing to maintain the video and audio quality at high levels. To prevent wear and deterioration, clean the mechanical parts using a head cleaning tape as routine maintenance. However, cleaning with a head cleaning tape alone is not enough for cleaning the entire tape transport mechanism, it is also recommended to apply periodical maintenance (inspection) to prevent troubles that may be caused by the sudden occurrence of failure. As the replacement, adjustment and servicing of parts require advanced skill and equipment, please consult the person in charge of professional video equipment at your nearest JVC-authorized service agent.

Head Cleaning

- To maintain beautiful pictures and sound, be sure to use a head cleaning tape to clean the head periodically. (Read the separate sheet "Precautions for Use of Head Cleaning Tape".) If head cleaning is not performed periodically, a type of mosaic noise called block noise may appear in the picture or sound may be interrupted.

Block Noise

- Use the provided head cleaning tape. Do not use head cleaning tapes other than specified. For instructions on how to use the head cleaning tape and precautions for its use, read the separate sheet "Precautions for Use of Head Cleaning Tape".
- When dirt adheres to the heads of the GY-DV500, the following indications appear during playback and recording check using the RET button on the lens section.
  - "RF" appears on the display panel.
  - "HEAD CLOG" appears on the counter display.
  - "VTR WARNING (HEAD)" appears in the viewfinder.
- If this kind of indication appears, please stop the recording. Head cleaning is required. This indicator disappears when the POWER is turned OFF, or when the cleaning tape is played back.



Periodical Maintenance

Contents : Check or replace the following mechanical parts according to the running time.

Running Time	500H	1000 H	1500H	2000H
Drum ass'y (including heads)	○	○	○	●
Head cleaner	☆	●	☆	●
Tape guides & rollers	○	☆	☆	●
Rotary encoder	–	☆	–	●
Belts & gears	☆	●	☆	●
Drive parts	○	○	☆	●

○: Clean, check and adjust.
☆: Clean and check. Replace as required.
●: Replace.

* The maintenance contents vary depending on the operating environment and method. Therefore, the above data should be considered as a reference.

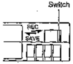
Time management

The accumulated running time of the unit can be confirmed with the hour meter display (which shows the accumulated drum running time). For details, see "HOUR METER DISPLAY" on page 92.

For consultations related to the maintenance programming or cost, please contact the person in charge of professional video equipment at your nearest JVC-authorized service agent.

1-4 Videocassette to be Used

- Use JVC's videocassette tapes marked with MiniDV for this unit.
- Videocassettes cannot be used upside down.
- Avoid storing a videocassette with unevenly wound tape, as this may damage the tape. Rewind it to the beginning before placing a cassette into storage.
- Store videocassettes in a place with little humidity and good ventilation where mould does not form.
- **After a videocassette tape has been used repeatedly, it becomes unable to maintain full performance due to an increase in noise caused by dropouts, etc. Do not continue to use a dirty or damaged tape, as this will reduce the rotary head life.**
- Note that if an ME80 videocassette is used at low temperatures, block noise tends to occur due to head contamination.
- **Videocassette tapes marked MiniDV are provided with a switch on the back for use in preventing accidental erasure.**
- Slide the switch to SAVE to protect the required recording in the tape from being overwritten.
- To record on the tape, slide the switch to REC.



For servicing
See the service manual page 2-7 "2.4.3 Cleaning".
For the part No. of cleaning tape, see section "7.1 PACKING" on this service manual.

1-5 Battery Pack to be Used

The GY-DV500 can use any of the following battery packs.

- Flat shape type
- Anton-Bauer battery pack: Trimpack 13/14 Series
  Magnum 13/14 Series
  Compack 13/14 Series
  Propack 13/14 Series

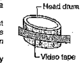
To display the remaining battery power accurately, set the VCR Setup Menu item No. 396 BATTERY TYPE according to the type of the battery pack in use. (See page 69)

* An Anton-Bauer battery pack cannot be connected directly to the camera. It is necessary to mount the optional battery holder.

- Battery holder: Anton-Bauer QRQ27
  For details on how to mount the battery holder, see page 37.

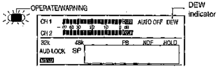
1-6 Condensation

- If the unit has been cooled down in a cold place and is then carried to a warm place, the moisture contained in the warm air may adhere to the head drum or tape guides and be cooled into water droplets. This phenomenon is referred to as condensation (dewing). When this occurs, the head drum and tape guides are covered with droplets allowing the tape to be stuck to them, leading to tape damage.
- Condensation occurs in the following cases:
  - When the unit is suddenly moved from a cold place to a warm place.
  - When a room heater has just started or when the unit is exposed directly to cold air from an air conditioner.
  - When the unit is placed in a very humid place.



Do not leave the videocassette inserted when moving the camera under conditions where the temperature environment changes.

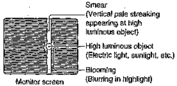
- When condensation occurs in this unit, the DEW indicator on the display lights up, and the WARNING LED blinks red. (See page 86)
  To remedy, leave the unit with the power ON and wait until the WARNING LED stops blinking red and the DEW indicator disappears from the counter display.



1-7 Characteristic CCD Phenomena

Smear and Blooming

Due to the physical structure of a CCD it is possible to induce vertical streaking (called "smear") when shooting an extremely bright light source. Another effect is the expansion of light around a bright light or object (called "blooming").
The CCD employed in this unit is characterized by inducing very little smear or blooming. Nevertheless, please be careful when shooting a bright light source.


Smear
(Vertical pale streaking appearing at high luminous object)
High luminous object
(Electric light, sunlight, etc.)
Blooming
(Blurring in highlight)
Monitor screen

Moire or Aliasing

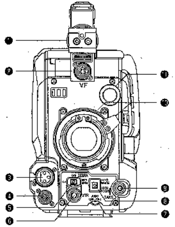
Shooting stripes or fine patterns may cause a jagged effect or a banding in fine mesh patterns.

White dots

High temperatures can cause CCD sensor pixels to malfunction with the effect of white dots in the image. This condition is conspicuous especially when gain is applied.
This is a characteristic of the charged-coupled device (CCD).
As far as possible, use the unit under conditions where the temperature of the unit does not increase.

2. CONTROLS, INDICATORS AND CONNECTORS

2-1 Front Section



❶ Viewfinder mount base, sliding securing ring

Mount the viewfinder on the base and secure it using the sliding securing ring.

☞ See "Attaching the Viewfinder" on page 31.

❷ [VF] Viewfinder connector (6-pin)

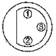
Connect the cable from the viewfinder here.

❸ [MIC IN] Microphone input connector (XLR 3-pin)

Balanced 3-pin connector for camera microphone.

- When the camera microphone to be connected is a phantom microphone or other type of microphone, set the CAM MIC 48V item on the Camera Setup menu. See page 77.
- When using a microphone with this connector, set the AUDIO INPUT switches ❼ ❽ on page 14 to FRONT in accordance with the audio channel (CH1 or CH2) to be recorded.

☞ See page 14.



Pin No.	Function
1	GND
2	HOT
3	COLD

CAUTION:

- The provided microphone is a phantom microphone. Please confirm that the CAM MIC 48 V item on the Camera SETUP Menu is set to "ON".
- When using a microphone other than a phantom microphone, first set the CAM MIC 48 V item to "OFF" before connecting the microphone. Otherwise the microphone may be damaged.

❹ [LENS] Lens control connector

Connect 12-pin lens control cable from lens.

Pin No.	Function	Pin No.	Function
1	RET switch	7	IRIS position
2	VCR trigger	8	IRIS A/R INPUT
3	GND	9	EXTENDER position
4	Lens AUTO/MANU control	10	ZOOM position
5	IRIS control	11	—
6	+12V DC	12	—

❺ [ZEBRA] Switch

When this switch is ON, a zebra pattern is superimposed on the viewfinder areas having video levels with a luminance level of 70% to 80%. This pattern can be used as a reference for manual adjustment of the lens iris.

* The zebra patterns are only displayed on the viewfinder screen. The zebra patterns are not generated for the MONITOR OUT or Y/C OUT output.
  ☞ See "Zebra Pattern during Manual Adjustment" on page 80.
- The default value is 70% - 80%. The luminance level can be changed with the ZEBRA setting in the VF DISPLAY Menu screen.
  ☞ See "ZEBRA" item on page 72.

While this switch is pressed to the SKIN AREA side, the color tone areas specified with the SKIN DTL ADJUST item on the ADVANCED PROCESS MENU are indicated in the viewfinder. The switch returns to the OFF position when released.

☞ See "How to Use Skin Detail" on page 84.

- The Skin Detail color tone areas are not indicated while the VTR playback picture is shown in the viewfinder.

❻ [VTR] VTR trigger button (record start/stop button)

Record start/stop can be effected with this button.
(It is interlocked with the VTR trigger button on the lens section.)

❼ [AUDIO LEVEL CH-1] CH-1 recording level control

Adjusts the recording level of the CH1 audio signal input. Normally, the camera is used with the control set to the maximum (10) position.

- To use this control, set the VCR Setup Menu item No. 246 FRONT VOLUME ENABLE to "ENABLE".

Note:

Even when the VCR Setup Menu item No. 246 is set to DISABLE, the recording level changes slightly when this control is turned.

❽ [AUTOWHITE/ACCU FOCUS] switch

AUTO WHITE:

- First, position a white object to occupy 80% of the centre of the image.
- Setting this switch to the upper position ("AUTO WHT") will provide automatic adjustment for white balance.

* It is not activated in preset, full auto shooting, full-time auto white balance and color bar modes.

☞ See "White Balance Adjustment" on page 45.

2-1 Front Section (Cont'd)

ACCU-FOCUS:

- When this switch is set to "ACCU FOCUS" in the lower position, the lens iris will be forced to open for approximately ten seconds.
- The depth of field can be reduced and the lens focusing can be adjusted more accurately.

CAUTION:

- As the automatic shutter is activated here, flicker may appear on the screen depending on the lighting conditions (such as a fluorescent lamp, etc.)
- This operation is not possible in the LOLUX mode.

❾ [TAKE] button

The Super Scene Finder (S.S.F.) function retains the time code data for IN point and OUT point or CUE point in the unit's memory.

☞ See "S.S.F. Function on" page 60.

❿ Lens mounting ring/Lens lock lever

Hold the lens and use the lever to turn the ring anticlockwise to release lens.

To mount lens make sure the lens guide pin fits well, and then turn the ring clockwise until firm.

☞ See "Attaching the Zoom Lens" on page 31.

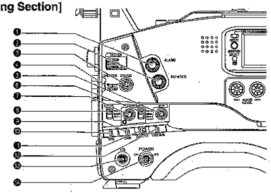
⓫ [FILTER] Color temperature conversion filter control knob

This knob changes the internal color temperature filter.

☞ See "Camera Settings" on page 42.

2-2 Right Side Section

[Camera Setting Section]



① [ALARM] Volume control
Turn to adjust the volume of the alarm tone that is output from the monitoring loudspeaker or earphone in case of a warning or other abnormal condition occurring with the GY-DV500.
Turn this control anticlockwise to reduce the volume. Setting this control to the minimum position mutes the alarm tone.

② [MONITOR] Audio monitor volume control
Adjusts the volume of the monitoring loudspeaker and earphone. The audio is muted when this control is set to the minimum position.

③ [STATUS] Status/menu button
Pressing this button in the normal screen mode (condition when menu is not shown) displays a status screen in the viewfinder. The displayed status mode changes each time the button is pressed.
☞ See "Status Screens" on page 25.
Pressing this button for more than 1 second in the normal screen mode displays the Camera Menu screen in the viewfinder. Pressing this button while the menu screen is displayed in the viewfinder makes the menu screen disappear.
☞ See "How to Select from the Camera Menu" on page 71.

④ [SHUTTER/MENU] dial
- Pressing this dial once in the normal screen mode (condition when menu is not shown) displays the shutter speed for approximately 5 seconds. When this dial is turned upwards while the shutter speed is displayed, the shutter speed becomes slower. When turned downwards, the shutter speed becomes faster. The selected shutter speed is memorised for each file. To return the memorised shutter speed to the factory preset, press the dial one more time while the shutter speed is displayed.
- When this dial is turned upwards or downwards while the menu screen is displayed, the cursor (>) also moves upwards or downwards to allow selection of items in the menu. To change the setting value of the item, press this dial. When the setting value starts blinking, turn this dial upwards or downwards to change the setting.
  ☞ See "How to Select Camera Menus" on page 71.

⑤ [LOLUX] LOLUX On/Off button
This button toggles the LOLUX mode on and off.
- LOLUX gain gives extremely low light level sensitivity for special applications. This will result in an increase of 33 dB (approximately 45 times) in the LOLUX mode.
- LOLUX operation takes priority over normal gain setting.
- If the unit is placed in the LOLUX mode when it is in full auto shooting mode, the auto level control (ALC) (one of the full auto shooting functions) will be made inactive, so that the LOLUX mode is given preference (FAW still remains active).

☞ See "GAIN BOOST UNDER LOLUX CONDITION" on page 82.

⑥ [BLACK] Black stretch/black compression switch
Switches the gain for the dark section of the image.
Set to an appropriate position depending on the video signal to be shot.

STRETCH	:	By stretching the signal only for the dark section, contrast in the dark portion of the image is enhanced.
NORMAL	:	Standard mode.
COMPRESS	:	When an entire image is relatively light and the contrast is low, the gain of the dark section is compressed to increase the contrast.

⑦ [FULL AUTO] Full auto shooting ON/OFF button and indicator
- This switch toggles the full auto shooting function on and off.
- The indicator lights when in the full auto mode.
- Full auto shooting combines the auto iris, auto level control (ALC) to automatically adjust the video signal level and the white balance to their optimum levels.
- The iris is placed in automatic mode even if the iris mode switch of the lens is in manual.
- The gain will vary continuously to the maximum of +12 dB. The shutter speed will vary continuously to the minimum of 1/240 of a second.
  ☞ See "Full Auto Shooting (FAS) function" on page 83.

2-2 Right Side Section [Camera Setting Section]

⑧ [AUTO IRIS] Auto iris level switch
This switch selects the automatic iris adjustment reference value according to the condition in which the camera is used.

BACK. L : Under back light (Opens the iris about 1 step from the standard level.)
NORMAL: Normal condition
SPOT. L : Under spotlight (Closes the iris about 1 step from the standard level.)

☞ See "SWITCH FUNCTIONS" on page 83.

⑨ [GAIN] switch
Electronically boosts the light sensitivity when there is insufficient illumination on the subject. The boosting level differs depending on the switch position as follows:
(Factory presets)
L : 0 dB (no boosting is applied)
M : 9 dB (boosted to approximately 3 times the original)
H : 18 dB (boosted to approximately 8 times the original)
- The boosting level for each switch position can be changed with the OPERATION menu screen. (☞ See page 73.)

The more the boosting level is increased, the more the resulting image will be noisy.

⑩ [VTR SAVE/STBY] switch
Used to select the status of the GY-DV500 when the power is turned ON and a videocassette is loaded.
STBY: The GY-DV500 is in the standby mode.
When a recordable videocassette is loaded, the GY-DV500 enters the record-pause mode.
SAVE: The GY-DV500 is in the save mode.
- The status of the GY-DV500 is displayed on the Status screen 1 in the viewfinder.

⑪ [OUTPUT] Color bar/Camera/Auto knee switch
This switch is used to select the output signal. When the video signal from the shooting camera is selected, the auto knee function is available.

CAM. AUTO KNEE ON:
Outputs the video signal from the shooting camera. In this mode, the auto knee function is available.

CAM. AUTO KNEE OFF:
Outputs the video signal from the shooting camera. In this mode, the auto knee function is not available.

BARS: Outputs the color bar signal. In this mode, the auto knee function is not available. Set to this position when adjusting the video monitor or when recording the color bar signal.

AUTO KNEE function
When shooting a foreground subject, such as a human being, etc., with a high-brightness background, if the brightness level is set for the foreground subject, the background image will be blurred with white. In such a case, a clearer background is obtained when the auto knee function is used.
It is effective especially in the following cases:
- When shooting a human being indoors with a view to the landscape out through a window.
- When shooting a human being in the shade on a fine day.
- When shooting a high-contrast scene.

> **CAUTION:**
> If a fast moving high-brightness section like a car in sunlight is shot, the auto knee function may change the brightness of the entire image along with the motion of the object. In this case, set the auto knee function to OFF.

⑫ [WHT.BAL] White balance switch
Three white balance modes are selectable with this switch.

B	:	If white balance is performed with the switch in this position, it will be memorised into B.
A	:	If white balance is performed with the switch in this position, it will be memorised into A.
PRST (PRESET)	:	A non-erasable white balance setting at 3200K.

- FAW (Full-time Auto White) mode can be set to A, B or PRESET with the OPERATION MENU (see page 73).
  In the FAW mode, video color temperatures are constantly sampled for automatic adjustment to a proper white balance.

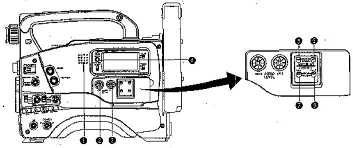
⑬ [NG] button
Pressing this button while recording or in the record-pause mode deletes the S.S.F. data stored in the memory of the GY-DV500 with the S.S.F. (Super Scene Finder) function.
This function is only valid in the MARK mode.
☞ See "S.S.F. (Super Scene Finder) Function" on page 60.

⑭ [POWER] switch
Turn the power ON and OFF with this switch.
When this switch set to ON while a videocassette is loaded, the GY-DV500 status differs depending on the setting of the VTR (SAVE/STBY) switch ⑩.

> **For servicing**
> **Even during FAS operation, the priority setting for the audio recording level is "CH1/CH2 AUDIO SELECT".**

2-2 Right Side Section (Cont'd)

[Audio Setting Section]



❶ Monitoring loudspeaker
- Enables EE monitoring of the input audio signal during recording, in the record-pause mode or in the stop mode. Outputs the playback sound in the playback mode. The sound to be output can be selected using the MONITOR SELECT switch ❹.
- The loudspeaker volume can be adjusted with the MONITOR volume control ❷ on page 12. The audio from the loudspeaker is not output when an earphone is plugged into the EARPHONE jack ❷ on page 20. The warning alarm tones are also output through this loudspeaker.

☞ See "ALARM INDICATIONS" on pages 86.

❷ [CH1 AUDIO LEVEL] CH1 recording level control
Adjust the recording level of the CH1 audio channel with this control.
- To use this control, set the CH1 AUDIO SELECT switch ❺ to "MANUAL". This control works regardless of the setting of the VCR Setup Menu item No. 246 FRONT VOLUME ENABLE. To use this control, set the AUDIO LEVEL CH-1 recording level control (❾ on page 10) on the front section to the maximum (10) position, or set the VCR Setup Menu item No. 246 FRONT VOLUME ENABLE to "DISABLE".

❸ [CH2 AUDIO LEVEL] CH2 recording level control
Adjust the recording level of the CH2 audio channel with this control.
- This control is valid only when the CH2 AUDIO SELECT switch ❻ is set to "MANUAL".

❹ [MONITOR SELECT] audio monitor selector switch
This switch is used to select the monitor sound output from the MONITORING LOUDSPEAKER ❶ or via the EARPHONE jack ❷ on page 20.
CH-1 : The CH1 channel audio is output.
MIX : CH1 and CH2 channel audio are output mixed.
CH-2 : The CH2 channel audio is output.

CAUTION:
Make sure to move switches all the way. Do not leave a switch stopped in a midway position. Noise will be generated and operation irregularities will occur.

❺ [CH-1 AUDIO SELECT] selector switch
This switch is used to select the method for adjusting the recording level of the CH-1 audio channel.
AUTO : The recording level is held at the reference level even when sounds greater than the reference level are input. The recording level does not increase when the input level is low.
MANUAL: The recording level can be adjusted with the CH-1 AUDIO LEVEL control ❷ or the CH-1 AUDIO LEVEL control ❾ on page 10. To use the AUDIO LEVEL CH-1 recording level control on the front section, set the VCR Setup Menu item No. 246 FRONT VOLUME ENABLE to "ENABLE".

❻ [CH-2 AUDIO SELECT] selector switch
This switch is used to select the method for adjusting the recording level of the CH-2 audio channel.
AUTO : The recording level is held at the reference level even when sounds greater than the reference level are input. The recording level does not increase when the input level is low.
MANUAL: The recording level can be adjusted with the CH-2 AUDIO LEVEL control ❸.

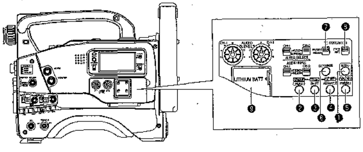
❼ [CH-1 AUDIO INPUT] selector switch
This switch is used to select the input section of the CH1 audio channel.
FRONT : The sound from the MIC IN connector on the front side section is input.
REAR : The sound from the CH-1 AUDIO IN connector on the rear side section is input.

❽ [CH-2 AUDIO INPUT] selector switch
This switch is used to select the input section of the CH2 audio channel.
FRONT : The sound from the MIC IN connector on the front side section is input.
REAR : The sound from the CH-2 AUDIO IN connector on the rear side section is input.

For servicing
When replacing the Lithium Battery, see page 41 "Setting the Date and Time" and then set the date and time as described therein.

2-2 Right Side Section (Cont'd)

[VCR Setup Block]



❶ [MENU] button
Press this button to enter the VCR setup menu mode. When the VCR setup menu mode is engaged, the "MENU" indicator in the LCD display lights and the counter display and viewfinder display are changed to the menu indication. In the VCR setup menu mode, pressing this button resumes the normal mode.

❷ [HOLD/GROUP] button
- Press this button when presetting the time code or user's bit. The presently displayed data is held (the "HOLD" indicator lights on the display) and the leftmost digit of the counter blinks. Pressing this button during presetting of time code or user's bit cancels the operation and recalls the previous display contents.
- In setup menu mode, this button is used to select the menu group.

❸ [SHIFT/ITEM] button
- During presetting of time code or user's bit, press this button to select the digit to be set. Each press of the button shifts the digit to be set (which blinks) to the right.
- In setup menu mode, this button is used to select the menu item.

❹ [ADVANCE/SELECT] button
- During presetting of time code or user's bit, press to select the value of the digit to be set. Each press of the button increases the number by 1.
- In setup menu mode, this button is used to select the value of a menu item.

❺ [PRESET/DATA SET] button
- During presetting of time code or user's bit, press to save the set value in the preset memory. The set time code or user's bit will be preset in the time code generator.
- In setup menu mode, this button is used to confirm the menu item setting and save the data in the memory.

- For details of the presetting of time code or user's bit, see page 56.
- For details on the setup menus, see page 67.

❻ [CONTINUE] button
If this button is pressed simultaneously with the LOG button ❸ on page 19 during the stop mode, the tape winds to the last S.S.F. data OUT point.
☞ See "About the Scene End Cue Up Function" on page 63.

TIME CODE GENERATOR setting switches

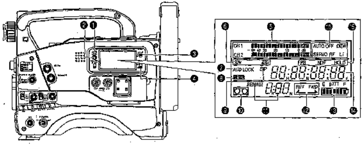
❼ [PRESET/REGEN] switch
Toggles the time code generator mode between PRESET and REGEN.
PRESET: Preset mode. Set to this position when newly presetting and recording the time code.
REGEN : Regeneration mode, in which the unit reads existing time codes on the tape and records time codes in continuation of the existing ones. Set to this position when you want to add additional time codes to time codes already recorded on the tape.

❽ [REC/FREE] run switch
Selects the time code running mode while the time code generator is in preset mode. This switch is not effective in the REGEN mode.
REC : The time code runs only during recording. This position allows you to record continuous time codes when recording scenes one after another.
FREE : The time code runs permanently.
* If this position is used when recording scenes one after another, the time codes become discontinuous at the change points between scenes.

❾ Lithium Battery Installation Compartment
Install a lithium battery (CR2032) in this compartment. The battery is used for the backup of the time code. The GY-DV500 is delivered without the battery installed. The provided lithium battery is for test use. It is recommended to install a new lithium battery. A new lithium battery can power the backup for about one year. See "Inserting and Replacing Backup Lithium Batteries" on page 34.

2-2 Right Side Section (Cont'd)

[VCR Display Section]



① **[OPERATE/WARNING] indicator**
Normally lights green.
Lights orange during the VTR SAVE (tape protect) mode.
This indicator lights or blinks in red in the case of a warning condition related to the remaining tape time, remaining battery power or other abnormal condition in the unit.
For details, see "ALARM INDICATIONS" on pages 86.

② **[RESET] button**
- Press to reset the CTL counter value.
- Pressing the button during presetting of time code or user's bit resets the time code or user's bit data to "00:00:00:00".

③ **[LIGHT] switch**
Turns the illumination of the back-lit display ON or OFF.
ON : The display is illuminated.
OFF : The display is not illuminated.
(Keep this switch at OFF during battery operation of the GY-DV500 or when it is required to reduce the power consumption for some reason.)

Note:
When a videocassette is loaded and the VTR switch is set to SAVE mode, the illumination will go out even if the backlight is ON.

④ **[COUNTER] switch**
Selects the contents displayed on the LCD counter display. The displayed contents when TC or UB is set can be selected using the VCR Setup Menu item No. 516 DISPLAY SELECT.
CTL : Set to this position to display the CTL counter.
TC : Set to this position to display time codes or for presetting the time code. (When the Menu item No. 516 DISPLAY SELECT is set to "TC".)
Time (Hour, Min., Sec.) is displayed. (When the Menu item No. 516 DISPLAY SELECT is set to "CLOCK".)
UB : Set to this position to display the user's bits of time codes or presetting the user's bit. (When the Menu item No. 516 DISPLAY SELECT is set to "TC".)
Date (Month, Day, Year) is displayed. (When the Menu item No. 516 DISPLAY SELECT is set to "CLOCK".)
☞ See "VCR Setup Menu Contents" on page 69.

⑤ **Audio level meters**
Show the audio input level of the CH-1 and CH-2 channels in the record mode or EE mode.
In the playback mode, the meters show the playback audio level.
"OVER" lights in case of excessive input.

CAUTION:
Immediately after the power is switched ON, the level meters may fluctuate. This is not a malfunction.

⑥ **32K/48K sampling frequency indication**
Indicates whether audio recording or playback occurs with 12-bit, 32 kHz sampling or 16-bit 48 kHz sampling.
- In the recording mode, the sampling frequency is set using the VCR Setup Menu item No. 245 SAMPLING RATE. In the playback mode, the indication conforms to the sampling rate of the recorded sound.

⑦ **[AUD LOCK] indicator**
Indicates whether the audio signal is locked to the video signal during recording and playback.

⑧ **[MENU] indicator**
Appears when the MENU button ⑪ on page 15 is pressed to select the VCR Setup Menu.

⑨ **SP indicator**
Indicates the tape speed in record mode.

⑩ **Cassette indicator**
Lights when the unit is loaded with a videocassette. Blinks during ejection or tape loading.

⑪ **[REMAIN] indicator**
The remaining tape time (minutes and seconds) is shown. For details, see page "Remaining Tape Time Display" on page 22.

2-2 Right Side Section (Cont'd)

⑫ **Tape transport direction indicators**
REV FWD One of the indicators lights according to the tape transport direction.
◄— —► is displayed in the record-pause mode and in the still picture mode.

⑬ **Remaining Battery Power Display**
The 7-dot segment bar display shows the remaining battery power.
* To display the remaining battery power accurately, set the VCR Setup Menu item No. 396 BATTERY TYPE according to the type of the battery pack in use.
☞ See "Remaining Battery Power Display" on page 22.

⑭ **Counter display**
- Usually, this section shows the data of the CTL counter, time code or user's bit. The display mode can be selected with the ④ COUNTER switch.
- Displays the VCR setup menu data when the GY-DV500 is in the VCR setup menu mode by pressing the MENU button ⑪ on page 15. The VCR setup menu includes the hour meter (accumulated drum operating time).
- This section shows an error code when an abnormal condition occurs with the unit.
☞ See "Counter Display Contents" on page 22.
☞ See "TROUBLES WITH ERROR CODE OUTPUTS" on page 90.

⑮ **Section for time code related indications**
- **[PB] Time code playback indicator**
  Lights when the time code is in playback mode.
- **[NDF] Non-drop frame indicator (U-ver. only)**
  Lights when the internal time code generator or the playback time code framing mode is non-drop frame. "DF" is displayed in the drop-frame mode.
  • It never lights when the CTL counter is displayed.
- **[HOLD] indicator**
  Lights when the time code generator display is held by pressing the HOLD button in the time code setting block. The time code or user's bit can be preset while this indicator is lit.
  ☞ See "Displaying Time Code" on page 56.

⑯ **Warning indicators**
- **[AUTO OFF] indicator**
  Lights when a non-recoverable error (e.g. tape winding error, drum stopped, etc.) occurs with the unit. This indicator also lights if condensation occurs.
  ☞ See "TROUBLES WITH ERROR CODE OUTPUTS" on page 90.
- **[DEW] indicator**
  Lights when condensation (dewing) occurs on the drum or other mechanism in the unit.
  The unit rejects all operations while this indicator is lit. When the condensation has disappeared, the indicator turns off and the unit accepts operations again.
- **[SERVO] indicator**
  Lights in the case of trouble with the drum servo during recording to indicate that normal recording is not being accomplished.
- **[RF] indicator**
  Lights when the video head is clogged. Head clogging is detected during playback and recording check using the RET button on the lens section. Note that it is not detected during recording.

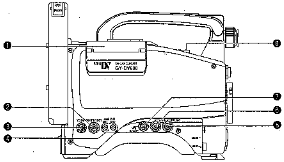
* Should this indicator light up, clean the head using the provided head cleaning tape. For instructions on head cleaning tape, read the separate sheet "Precautions for Use of Head Cleaning Tape".

- **[Li] Lithium battery indicator**
  Lights and indicates the necessity of replacement when the lithium battery that backs up data of the built-in time code generator is nearly exhausted.
  ☞ See "Inserting and Replacing Backup Lithium Batteries" on page 34.

For servicing
See the service manual page 2-7 "2.4.3 Cleaning".

For servicing
The protocol of VCR control is not included in this service manual.

2-3 Left Side Section



❶ Cassette cover

Pressing the EJECT switch on top of the section opens this cover so that a videocassette can be inserted or removed from the unit. The cover can be locked automatically by pushing and closing it.

* If the cassette cover is not closed, the GY-DV500 will remain inoperative.

Memo:
To prevent penetration of foreign objects into the unit, do not leave the unit with the cassette cover open.

❷ [MONITOR OUT] monitor output connector (BNC)

- Composite video signal output with setup (for U-ver.).
  Composite video signal output (E-ver.).
- An EE image or the playback image is output through the VCR section.
  An EE image is output during other modes than the playback mode.

* Data for the Camera and VCR setup menus or time code is not output.

❸ [Y/C OUT] connector (4P)

Separate YC video signal output connector.

❹ [LINE OUT CH-1/CH-2] connector (RCA)

Output connector for audio signals.

- Outputs the input audio signal in the record and stop modes.
- Outputs the playback audio signal in the playback mode.
- Alarm sound is not output.

❺ [TEST OUT] connector (BNC)

Composite video signal output connector.
Outputs the camera image.

❻ [SYNC.IN] connector (BNC)

For inputting the sync signal when the GY-DV500's camera image is synchronized with an external component.

Memo:
- The camera cannot be synchronized with a VCR playback signal.
- When the power is switched ON while an external sync signal is input, the screen moves in a vertical direction for a few seconds. This is not a malfunction.
- Only for the combined H (horizontal)/V (vertical) synchronizing signal. Synchronization with the SC (sub-carrier) of the input signal is not possible.
  Even if SC adjustment is performed, a phase shift will take place at the time of power on/off. The SC phase must be adjusted each time the power is turned on.
- Color frame synchronization is not possible.
- If the external sync signal is disrupted during recording, the "SYNC INH" (SYNC INHIBIT) indicator is displayed on the counter display and recording stops.
- If the external sync signal is disrupted during playback, playback of the disturbed video image continues.
  Start playback again after synchronization is obtained and the signal is stabilized.

❼ [VTR REMOTE] connector

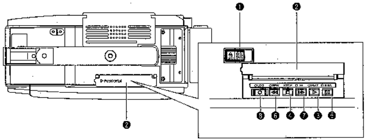
A part of the unit's functions can be controlled externally. To remote control the unit using the control signal of this connector, the VCR Setup Menu item No. 050 REMOTE SELECT must be set to "RS232C".
For details, please consult your JVC dealer.

Note:
- When a cable is connected to the VTR REMOTE connector, the VTR Setup Menu is not displayed in the viewfinder. Make settings on the VTR Setup Menu while the cable is not connected.
- When a cable is connected to the VTR REMOTE connector, the VCR operation mode will not be displayed correctly on the Status 1 screen in the viewfinder.

❽ Microphone attachment holes

For attaching the microphone holder KA-A50 (optional).
☞ See "Attaching the Microphone (optional)" on page 32.

2-4 Top Section



❶ [EJECT] switch

Slide to the side when inserting or ejecting the videocassette. Sliding this switch opens the cassette cover. If the switch is moved while the power is off, the cassette cover opens but it is not possible to insert or eject the cassette.

❷ Operation cover

Open this cover when operating in the playback mode. Otherwise, keep this cover closed.

❸ [PLAY] button

Press to start playback. In play mode, the unit outputs the video and audio signals of normal playback and the LED indicator above the PLAY button lights.

* If the auto tracking is active at the moment the play mode is entered, the playback video will be interfered with digital noise.

❹ [STOP] button

Press to enter stop mode. The drum keeps rotating in stop mode. However, when stop mode has continued for about 30 minutes, the unit enters the tape protect mode, in which the drum stops rotation and the tape tensioner is released. It takes more time than usual to enter the record or play mode from the tape protect mode.

* The time until the tape protect mode is initiated can be set to 3 or 30 minutes with the VCR Setup Menu item No. 307 LONG PAUSE TIME. When used in a cold environment, the setting will be 3 minutes regardless of the setting on the VCR Setup Menu.

☞ See page 69.

❺ [STILL] button

Press to enter the still picture mode during playback or in the search mode.
When the still picture mode has continued for about 30 minutes, the unit automatically switches to the stop mode. (Tape protect mode)

* The time until the tape protect mode is initiated can be set to 3 or 30 minutes with the VCR Setup Menu item No. 307 LONG PAUSE TIME. When used in a cold environment, the setting will be 3 minutes regardless of the setting on the VCR Setup Menu.

❻ [REW] button

Press to rewind the tape.

- Pressing the button in stop or fast forward mode initiates the rewind mode. The LED indicator above the REW button lights in this mode.
- Pressing the button during playback, still or forward search initiates reverse search at about 10 times the normal play speed. The LED indicators above the PLAY and REW buttons light during reverse search.

❼ [FF] button

Press to fast forward tape.

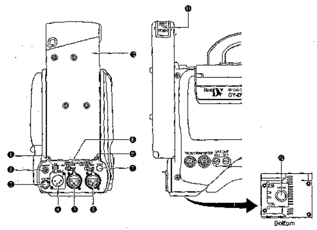
- Pressing the button in stop or rewind mode initiates fast forward mode. The LED indicator above the FF button lights in this mode.
- Pressing the button during playback, still or reverse search initiates forward search at about 10 times the normal play speed. The LED indicators above the PLAY and FF buttons light during forward search.

❽ [LOG] button

- When the REW button is pressed while this button is kept pressed, the S.S.F. data stored in the unit's memory are written to the tape. The LED indicator above the LOG button lights while S.S.F. data is being written to the tape.
- When the CONTINUE button (❻ on page 15) is pressed while this button is kept pressed in the stop mode, the tape winds to the S.S.F. data's last OUT point, after which the unit enters the record-pause mode. (Scene End Cue Up)
  The FF button's LED blinks during Scene End Cue Up.
  ☞ See "Writing S.S.F. Data to Tape" on page 63.

CAUTION:
- Only the EJECT switch and STOP button work during recording.
- If the cassette cover is open, all operations are rejected.

2-5 Rear Section



❶ [DV] connector

Using a DV cable (optional), a digital video component with DV connector can be connected here.
This connector is used for input and output of the DV signal or to input the VCR control signal from the digital video component with DV connector.

- To record the DV signal from this connector, set the VCR Setup Menu item No. 126 INPUT SELECT to "IEEE1394".
- To remote control the VCR with a VCR control signal from this connector, set the VCR Setup Menu item No. 050 REMOTE SELECT to "IEEE1394".
  The setup level signal for the DV output connector is not provided. (NTSC only)

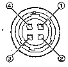
❷ [EAR.] earphone jack

This is a stereo mini-jack for connecting an audio monitoring earphone. Plug in an earphone or headphone with a 3.5 mm diameter plug. (Monaural mini jack)
The earphone can also be used to monitor alarm tones depending on situations.
The sound from the monitoring loudspeaker is interrupted when an earphone is connected here.

Memo:
Only the left-channel sound is heard when a stereo mini-jack is used.

❸ [DC OUTPUT] connector

Power output connector to a wireless microphone transmitter, etc. The supply voltage is identical to the voltage supplied to the unit (DC 12V max. 0.1 A).

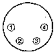


(Surface profile)

No.	Signal
①	GND
②	—
③	—
④	DC +12V (power through)

❹ [DC INPUT] connector (XLR 4-pin)

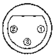
Power input connector for 12 V DC. Connect with the AA-P250 optional AC power adapter. When a cable is connected here, the power supply from the battery pack is interrupted and the source is switched to the power supplied through this connector.



No.	Signal
①	GND
②	—
③	—
④	+12V

❺ [CH-1 AUDIO IN] CH-1 audio input connector (XLR 3-pin)

Connect the external audio equipment or microphone to this connector. Set the CH-1 AUDIO IN LINE/MIC select switch ❽ according to the connected equipment.
The audio signal input through this connector is recorded on the CH-1 audio channel. To record the audio of this connector, set the CH-1 AUDIO INPUT switch ❷ on page 14 to "REAR".
(AUDIO IN connector)



No.	Signal
①	GND
②	HOT
③	COLD

2-5 Rear Section (Cont'd)

❻ [CH-2 AUDIO IN] CH-2 audio input connector (XLR 3-pin)

Connect the external audio equipment or microphone to this connector. Set the CH-2 AUDIO IN LINE/MIC select switch ❾ according to the connected equipment.
The audio signal input through this connector is recorded on the CH-2 audio channel. To record the audio of this connector, set the CH-2 AUDIO INPUT switch ❸ on page 14 to "REAR".

❼ Back tally lamp

This lamp lights up when the GY-DV500 enters the record mode. It blinks during the transition to the record mode.

- Use the VCR Setup Menu item No. 082 BACK TALLY MODE to select whether or not the lamp should light and the lighting pattern.
  ☞ See "BACK TALLY MODE" on page 68.

❽ [CH-1 AUDIO IN LINE/MIC] CH-1 AUDIO select switch

Selects the audio signal input to the ❺ CH-1 AUDIO IN connector.

LINE : Set to this position when connected to audio equipment, etc. The reference input level is +4 dBs.
MIC : Set to this position when the microphone is connected. The reference input level is -60 dBs.
MIC +48V ON:
Set to this position when the microphone requiring +48 V power supply (phantom microphone, etc.) is connected.
This connector supplies +48 V DC current.

❾ [CH-2 AUDIO IN LINE/MIC] CH-2 AUDIO select switch

Selects the audio signal input to the CH-2 AUDIO IN connector ❻.

LINE : Set to this position when connected to audio equipment, etc. The reference input level is +4 dBs.
MIC : Set to this position when the microphone is connected. The reference input level is -60 dBs.
MIC +48V ON:
Set to this position when a microphone requiring +48 V power supply (phantom microphone, etc.) is connected. This connector supplies +48 V DC current.

CAUTION:
When connecting a component that does not require +48 V power supply, make sure that the switch is not set to this position before the connection is made.

❿ Battery holder

Mount a Flat Shape type battery pack here.
☞ See "Attaching a Flat Shape Type Battery Pack" on page 36.

⓫ Battery holder lock release knob

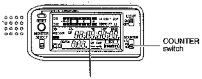
This knob is used to open the battery case cover. Press the knob to open the cover.

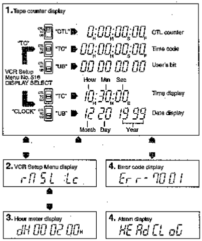
⓬ [BRAKER]

The braker trips when the power consumption exceeds the capacity.
If the braker trips, confirm that the power consumption does not exceed the wattage rating. Then press BRAKER before turning the power ON again to put the camera in the operating status.
If the unit still does not work normally, please consult the person in charge of professional video equipment at your nearest JVC-authorized service agent.

For servicing
See the service manual page 1-1 "RESETTING THE POWER CIRCUIT PROTECTION BREAKER".

2-6 Counter Display Contents

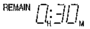

COUNTER switch
Counter display


1. Tape counter display
"TC"
"CTL"
0:00:00:00
H M S F
CTL counter
"TC"
00:00:00:00
Time code
"UB"
00 00 00 00
User's bit
VCR Setup Menu No. 516 DISPLAY SELECT
Hour Min Sec
"TC"
10:30:00
Time display
"CLOCK"
"UB"
12 20 1999
Month Day Year
Date display
2. VCR Setup Menu display
rASL Lc
4. Error code display
Err-7001
3. Hour meter display
dH 00 02 00H
4. Alarm display
HEAd CLoG

Remaining Tape Time Display

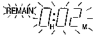
This display shows the remaining tape time (minutes/seconds) in record and play modes.

- Example: 30 minutes of remaining tape.

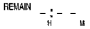

REMAIN
0:30
H M

- This indicator blinks when remaining tape time is equivalent to less than 2 minutes.

* An alarm sounds as a warning when remaining tape time is equivalent to less than 2 minutes in the record mode


REMAIN
0:02
H M

- The following display appears when no videocassette is loaded or during the calculation of remaining tape that takes place immediately after a videocassette is inserted.



The counter display shows the following 4 types of information.

1. Tape counter display

The counter display usually functions as a tape counter (hour, minute, second, frame). It can be switched to a CTL counter, time code or user's bit display by using the COUNTER switch. (When the VCR Setup Menu item No. 516 DISPLAY SELECT is set to "TC".)

- **CTL counter**: Time between -9 hr. 59 min. 59 sec. 29 frames and 9 hr. 59 min. 59 sec. 29 frames can be displayed. Running mode is fixed as non-drop frame.
  * CTL counter indication may also corrupt at playback of segment which time code signal is not continuously recorded.
- **Time code** : Time between 0 hour and 23 hr. 59 min. 59 sec. 29 frames can be displayed.
- **User's bit** : Hexadecimal number from 0 to F is displayed in 8 digits.

When the VCR Setup Menu item No. 516 DISPLAY SELECT is set to "CLOCK", the date and time are displayed. Set the COUNTER switch to TC or UB.

TC: Time (Hour, Min., Sec.) is displayed.
UB: Date (Month, Day, Year) is displayed.

- Press the MENU button to switch to the VCR Setup Menu setting display.

2. VCR Setup Menu setting display

This display is used when setting the setup menus. After setting of the setup menus, the tape counter display returns. For details, see "DISPLAYING AND SETTING VCR SETUP MENUS" on page 67.

3. Hour meter display

The hour meter is displayed by selecting the HM group from the VCR Setup Menu.

The hour meter data refers to the accumulated head drum running time.

4. Error code/Alarm display

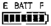
The error code or alarm indicator is displayed automatically in case an abnormal condition occurs with the unit.

☞ See "TROUBLES WITH ERROR CODE OUTPUTS" on page 90.
☞ See "ALARM INDICATIONS" on page 86.

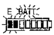
Remaining Battery Power Display

The 7-dot segment bar display shows the remaining battery power. The lighted segment bars decrease as the remaining battery power decreases.

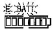
- To display the remaining battery power accurately, set the VCR Setup Menu item No. 396 BATTERY TYPE according to the type of the battery pack in use.



All segment bars light when a fully charged battery pack is attached.

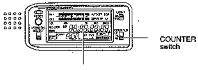


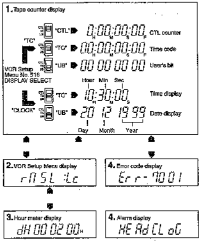
The last 2 segment bars and "BATT" start to blink when the battery is nearly exhausted. Replace with a fully charged battery pack.



When the battery capacity has run out, "E" and "BATT" blink and the unit stops operation automatically.

2-6 Counter Display Contents


COUNTER switch
Counter display


1. Tape counter display
"TC"
"CTL"
0:00:00:00
H M S F
CTL counter
"TC"
00:00:00:00
Time code
"UB"
00 00 00 00
User's bit
VCR Setup Menu No. 516 DISPLAY SELECT
Hour Min Sec
"TC"
10:30:00
Time display
"CLOCK"
"UB"
20 12 1999
Day Month Year
Date display
2. VCR Setup Menu display
rASL Lc
4. Error code display
Err-7001
3. Hour meter display
dH 00 02 00H
4. Alarm display
HEAd CLoG

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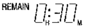
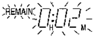
This display shows the remaining tape time (minutes/seconds) in record and play modes.

- Example: 30 minutes of remaining tape.

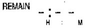

REMAIN
0:30
H M

- This indicator blinks when remaining tape time is equivalent to less than 2 minutes.

* An alarm sounds as a warning when remaining tape time is equivalent to less than 2 minutes in the record mode


REMAIN
0:02
H M

- The following display appears when no videocassette is loaded or during the calculation of remaining tape that takes place immediately after a videocassette is inserted.



The counter display shows the following 4 types of information.

1. Tape counter display

The counter display usually functions as a tape counter (hour, minute, second, frame). It can be switched to a CTL counter, time code or user's bit display by using the COUNTER switch. (When the VCR Setup Menu item No. 516 DISPLAY SELECT is set to "TC".)

- **CTL counter**: Time between -9 hr. 59 min. 59 sec. 24 frames and 9 hr. 59 min. 59 sec. 24 frames can be displayed.
  * CTL counter indication may also corrupt at playback of segment which time code signal is not continuously recorded.
- **Time code** : Time between 0 hour and 23 hr. 59 min. 59 sec. 24 frames can be displayed.
- **User's bit** : Hexadecimal number from 0 to F is displayed in 8 digits.

When the VCR Setup Menu item No. 516 DISPLAY SELECT is set to "CLOCK", the date and time are displayed. Set the COUNTER switch to TC or UB.

TC: Time (Hour, Min., Sec.) is displayed.
UB: Date (Day, Month, Year) is displayed.

- Press the MENU button to switch to the VCR Setup Menu setting display.

2. VCR Setup Menu setting display

This display is used when setting the setup menus. After setting of the setup menus, the tape counter display returns. For details, see "DISPLAYING AND SETTING VCR SETUP MENUS" on page 67.

3. Hour meter display

The hour meter is displayed by selecting the HM group from the VCR Setup Menu.

The hour meter data refers to the accumulated head drum running time.

4. Error code/Alarm display

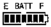
The error code or alarm indicator is displayed automatically in case an abnormal condition occurs with the unit.

☞ See "TROUBLES WITH ERROR CODE OUTPUTS" on page 90.
☞ See "ALARM INDICATIONS" on page 86.

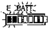
Remaining Battery Power Display

The 7-dot segment bar display shows the remaining battery power. The lighted segment bars decrease as the remaining battery power decreases.

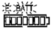
- To display the remaining battery power accurately, set the VCR Setup Menu item No. 396 BATTERY TYPE according to the type of the battery pack in use.



All segment bars light when a fully charged battery pack is attached.



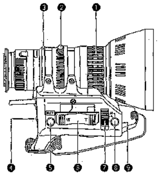
The last 2 segment bars and "BATT" start to blink when the battery is nearly exhausted. Replace with a fully charged battery pack.

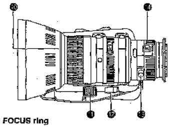


When the battery capacity has run out, "E" and "BATT" blink and the unit stops operation automatically.

2-7 Lens (optional)

[S14 x 7.3B12]





① FOCUS ring
Manual focus ring.

② ZOOM lever/ring
This is the manual zoom ring equipped with a zoom lever. To adjust the zoom manually, turn the zoom mode knob ⑫ to position "M".

③ IRIS ring
Manual iris ring. To activate the auto iris feature, set the Iris Mode switch ⑦ to A.

④ [VTR] Trigger button
To start/stop shooting.

⑤ [RET] return video button
The return video signal from the VCR section can be monitored in the viewfinder only while this button is pushed.

- The playback picture can be viewed in the viewfinder during this operation.

⑥ ZOOM servo control lever
To operate the servo zoom feature with this lever, set the ZOOM knob ⑫ to S.

- Pressing the W section of this lever increases the angle of the lens for a wider shooting angle.
- Pressing the T section of this lever narrows the lens angle perspective for telephoto shots.
- Pushing harder changes the speed of the zoom.

⑦ IRIS mode switch
A: Activates the auto iris feature.
M: Allows manual iris control.

⑧ Momentary auto iris button
When the IRIS MODE switch ⑦ is at "M", pushing this button activates the Auto Iris Function while it is held down only.

⑨ [S] IRIS speed adjusting control
For adjusting the iris operation speed.

Memo:
If the speed becomes too fast, hunting may occur.
- To avoid the phenomena described above, perform adjustment again.

⑩ FILTER thread
Protect the lens with a clear filter or UV filter by screwing the filter onto the thread inside the lens hood from the front. Other filters can be used for various effects.

CAUTION:
The filter thread section rotates, so pay attention when mounting a polarizing filter.

⑪ ZOOM servo connector
Connect an optional zoom servo unit here.

⑫ ZOOM mode knob
S: Servo zoom mode. Allows operation by the zoom servo control lever ⑥.
M: Manual zoom mode. Allows zoom control by the zoom lever/ring ②.

⑬ BACK FOCUS ring/fixing screw
For back focus adjustment only. Secure with the screw knob after adjustment.
☞ See "Back Focus Adjustment" on page 44.

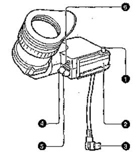
⑭ Macro focusing ring (for close-up shooting)
By rotating this ring in the direction of the arrow, close-up shooting of very small objects becomes possible.
Normal focus adjustment and zooming are not available in the macro mode.
To shoot images in the macro mode, set the focus ring ① to the infinite position and the zoom ring ② to the maximum wide-angle position. To adjust the focus of the macro image, rotate this ring in the direction of the arrow until the object is focused.

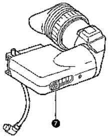
CAUTION:
- The back-focus knob is located close to the macro ring, be careful not to mistake the back-focus knob for the macro ring.
- After the required operation, be sure to return the macro focusing ring to the normal position.

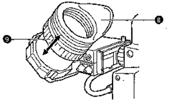
☞ See "Attaching the Zoom Lens (optional)" on page 31.
☞ See "Back Focus Adjustment" on page 44.

2-8 1.5-Inch Viewfinder (optional)

[VF-P115B]







① Stopper screw
This screw prevents the viewfinder from coming off the camera.

② Mounting guide
To attach on the camera.

③ Connector
Connect to the camera.

④ [CONT] contrast adjustment
To adjust the contours of the viewfinder image.

⑤ [BRIGHT] brightness adjustment
To adjust the brightness of the viewfinder.

⑥ [TALLY] switch
Set this switch to OFF to prevent the tally light ⑦ from turning on and informing people that they are being recorded. However, the REC indicator lamp in the eyepiece will not turn off.

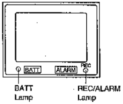
⑦ Tally light
Lights when recording is in progress. To prevent this light from coming on, set the tally switch ⑥ to "OFF".

⑧ Eyepiece
Ensures that ambient light does not reach the viewfinder screen or falls into the eye of the cameraman.
The eyepiece can be opened to allow direct observation of the viewfinder screen.

⑨ Eyepiece focusing ring
Loosen this ring to move the eyepiece back or forth to adjust the diopter.

2-9 Indications in Viewfinder

■ WARNING LED INDICATORS INSIDE THE VIEWFINDER



The viewfinder has two LED indicators below the screen. These LEDs light or blink to indicate the present status of the camera or the VCR.

- **[BATT] battery lamp**
  This lights red when the battery voltage becomes too low for operating the camera.
- **REC/ALARM lamp**
  This lights or blinks green under the following circumstances.
  Steady green : During recording.
  Blinks green : • While the GY-DV500 switches from record-pause to recording.
  • Immediately before the tape is running out or when it has run out.
  • When an error occurs in the GY-DV500.

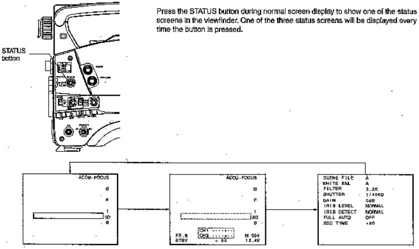
■ VIEWFINDER SCREEN DISPLAY

The following indications are displayed on the viewfinder screen. (However, this information is not displayed while the VCR section is playing back a tape.)

- ■ Status screens (screens for use in checking the current camera settings)
- ■ Alarm message display
- ■ Safety zone display
- ■ Setting screen (screen for use in the camera and VCR setup)
- ■ Auto white balance display
- ■ Shutter speed display

■ Status Screens

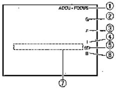
Press the STATUS button during normal screen display to show one of the status screens in the viewfinder. One of the three status screens will be displayed every time the button is pressed.



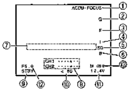
SCENE FILE A
WHITE BAL A
FILTER 3.2K
SHUTTER 1/1000
GAIN 0dB
IRIS LEVEL NORMAL
IRIS DETECT NORMAL
FULL AUTO OFF
REC TIME <60

Status 0　Status 1　Status 2

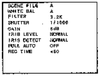
2-9 Indications in Viewfinder (Cont'd)



Status 0



Status 1



SCENE FILE A
WHITE BAL A
FILTER 3.2K
SHUTTER 1/1000
GAIN 6dB
IRIS LEVEL NORMAL
IRIS DETECT NORMAL
FULL AUTO OFF
REC TIME <60

Status 2

• Status 0

Display Position	Display	Function
①	ACCU-FOCUS	Blinks during the ACCU-FOCUS operation.
	SKIN AREA	Blinks while the skin tone detail color area is displayed.
	S	Displayed when the SHUTTER or V-SCAN is ON.
	FAS	Displayed when the Full Auto Shooting is ON.
	ALC	Displayed when the ALC alone is ON.
②	G	Displayed in other modes than 0 dB, LOLUX and ALC.
	L	Displayed during LOLUX operation.
③	F	Displayed when FAW alone is ON.
④	I	Displayed when IRIS BACK LIGHT or IRIS SPOT LIGHT is selected.
⑤	SD	Displayed while the Skin Detail function is in operation.
⑥	B	Displayed when BLACK STRETCH or BLACK COMPRESSION is selected.
⑦	Event display	See the table below.

⑦ Event display

Event is displayed in the viewfinder for only about 2 seconds when any of the following switches is operated.

Switch	Event Display Contents	
ZEBRA	ZEBRA	ON, OFF
BLACK	BLACK	STRETCH, NORMAL, COMPRESS
GAIN	GAIN	–3 dB, 0 dB, 6 dB, 9 dB, 12 dB, 18 dB, ALC
WHT. BAL	WHITE BAL	A, B, PRESET, FAW
FULL AUTO	FULL AUTO	ON, OFF
AUTO IRIS	IRIS	BACK.L, NORMAL, SPOT.L
LOLUX	LOLUX	ON, OFF
FILTER knob	FILTER	3.2K, 5.6K, 5.6K+ND
VTR	VTR	STBY, SAVE
AUTO KNEE	AUTO KNEE	ON, OFF

2-9 Indications in Viewfinder (Cont'd)

• Status 1

In addition to the information on the Status 0 screen, this screen displays audio indicators and information on remaining tape, voltage and lens F-number.

Display position	Display	Function
⑧	(Example) CH1- - - - + - - CH2- - - - + - -	Shows the input level of the audio input channel. Display ON/OFF can be selected using the VF DISPLAY menu screen. ☞ See "AUDIO DISPLAY" on page 72.
⑨	STBY	VCR in standby mode
	SAVE	VCR in save mode
	STOP	VCR in stop mode
	REC	VCR in record mode
	FF	VCR in fast-forward mode
	REW	VCR in rewind mode
	EJECT	VCR in reverse search mode
⑩	(Example) < 60 (Example) 12: 34: 56: 20	Remaining tape indication (displayed in 1-minute steps) When the tape is used for a long time, the remaining tape may not be indicated accurately. At the beginning of the tape, in particular, the indication may show smaller value than the actual one. Time code display Time code display is available when the "REC TIME" item on the VF DISPLAY menu screen is set to TIME CODE. ☞ See "REC TIME" on page 72.
⑪	(Example) 12.4V	Voltage indication (displayed in 0.1 V steps)
⑫	OPEN, F2, F2.8, F4, F5.6, F8, F11, F16, CLOSE	Shows the F-number of the connected lens. It is not displayed when the lens is removed. For some lenses, no display appears. Display ON/OFF can be selected on the VF DISPLAY menu screen. ☞ See "F NO.DISPLAY" on page 72.
⑬	(Example) M:99	In the Super Scene Finder (S.S.F.) mode, the number of memorized scenes is shown. M: In MARK mode C: In CUE mode Number: Number of memorized scenes

Note:
When the RS-232C cable is connected, the VCR operation mode may not be displayed correctly.

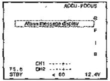
• Status 2

This screen displays the camera setup statuses.
Event display is not available while this screen is displayed.

Indication	Indication Contents
SCENE FILE	A, B, OFF
WHITE BAL	A, B, PRESET, FAW
FILTER	3.2K, 5.6K, 5.6K+ND
SHUTTER	OFF, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/60.1 to 1/2084.6 (in VARIABLE mode), EEI (in ALC mode)
GAIN	-3dB, 0dB, 6dB, 9dB, 12dB, 18dB, LOLUX, ALC
IRIS LEVEL	NORMAL, BACK L, SPOT L
FULL AUTO	ON, OFF
REC TIME	Remaining tape time or time code.

2-9 Indications in Viewfinder (Cont'd)

■ Alarm Message Display



The following alarm messages are displayed on the status 0 and status 1 screens.

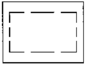
Indication	Contents
LOW BATTERY	The battery capacity is nearly exhausted.
CLOSE CASSETTE COVER	The cassette cover is not closed.
VTR WARNING [HEAD]	Head clogging
VTR WARNING [SERVO]	Servo error
VTR WARNING [DEW]	Condensation
VTR WARNING [HARD]	Hardware error
VTR WARNING [STOP]	Operation stopped
VTR WARNING [REW]	Rewinding abnormality
TAPE NEAR END	Remaining tape time is less than about 2 minutes in the record mode
TAPE END	Tape end reached
REC INHIBIT	An unrecordable videocassette (the switch on the back of the cassette is set to SAVE) is inserted.
NO TAPE	VTR trigger is pressed with no tape loaded.

2-9 Indications in Viewfinder (Cont'd)

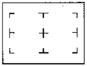
■ Safety Zone

Three types of safety zone items can be displayed in the viewfinder. Select the required one with the SAFETY ZONE item on the VF DISPLAY menu screen.

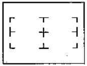
OFF



ZONE 1

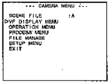


ZONE 2



ZONE 3

■ Setting the Screen Display

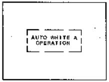


```
 --- CAMERA MENU ---

  SCENE FILE          :A
▷VF DISPLAY MENU
  OPERATION MENU
  PROCESS MENU
  FILE MANAGE
  SETUP MENU
  EXIT
```

Screen used for making various settings of the camera and VCR.
☞ See "Camera Menu Screen Flow" on page 70.
☞ See "VCR Setup Menu" on page 66.

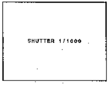
■ Auto White Balance Display



```
AUTO WHITE A
 OPERATION
```

This screen appears during the auto white balance adjustment operation to display various data.
☞ See "White Balance Adjustment" on page 45.

■ Shutter Speed Display



```
SHUTTER 1/1000
```

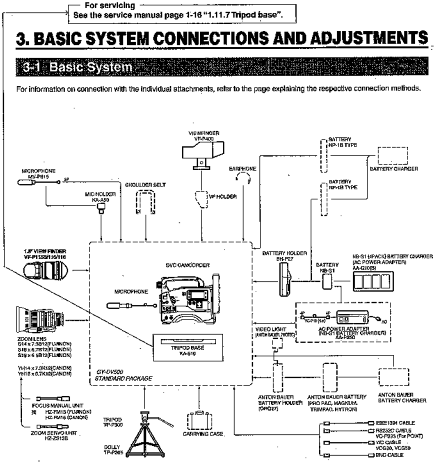
When the SHUTTER dial is pressed, a shutter speed is displayed (for approx. 5 sec.).
In addition, whenever the shutter speed is altered by using the SHUTTER dial, the shutter speed is displayed. While this display is shown, other displays disappear.
☞ See "SHUTTER/MENU dial" on page 12.

For servicing
See the service manual page 1-16 "1.11.7 Tripod base".

3. BASIC SYSTEM CONNECTIONS AND ADJUSTMENTS

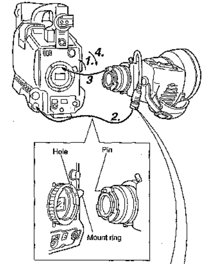
3-1 Basic System

For information on connection with the individual attachments, refer to the page explaining the respective connection methods.


VIEWFINDER
VF-P400
MICROPHONE
MV-P615
3P
SHOULDER BELT
MIC HOLDER
KA-A50
VF HOLDER
EARPHONE
BATTERY
NP-1B TYPE
BATTERY CHARGER
BATTERY
NP-1B TYPE
1.5" VIEW FINDER
VF-P115B/116/116
DVC CAMCORDER
MICROPHONE
BATTERY HOLDER
BH-P27
BATTERY
NB-G1
NB-G1 (4PACK) BATTERY CHARGER
(AC POWER ADAPTER)
AA-G10(B)
4P
4P
VC-710 (5m)
AC
AC POWER ADAPTER
(NB-G1 BATTERY CHARGER)
AA-P250
VIDEO LIGHT
(ANTON BAUER PROTEC)
TRIPOD BASE
KA-510
ZOOM LENS
S14 x 7.3B12(FUJINON)
S18 x 6.7B12(FUJINON)
S19 x 6 5B12(FUJINON)
YH14 x 7.3K12(CANON)
YH18 x 6.7K12(CANON)
GY-DV500
STANDARD PACKAGE
FOCUS MANUAL UNIT
※ HZ-FM13 (FUJINON)
HZ-FM15 (CANON)
ZOOM SERVO UNIT
HZ-ZS13B
TRIPOD
TP-P300
DOLLY
TP-P205
CARRYING CASE
ANTON BAUER
BATTERY HOLDER
(QRC27)
ANTON BAUER BATTERY
(PRO PAC, MAGNUM,
TRIMPAC, HYTRON)
ANTON BAUER
BATTERY CHARGER
IEEE1394 CABLE
RS232C CABLE
VC-P833 (For PC/AT)
Y/C CABLE
VCG30, VCG50
BNC CABLE

* HZ-FM13 cannot be used with S14X7.3B12/U.
Please use the Focus Manual Unit (FMM-8, CHF-3, CFC-12-890) manufactured by Fujinon.

3-2 Attaching the Zoom Lens (optional)

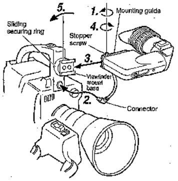


When unplugging the cable connector, first remove the lens itself. Then grasp this portion and pull straight out.

1. Loosen the mount ring.
2. Connect the cable connector.
3. Attach the lens with its pin aligned with the hole in the mount.
4. Tighten the mount ring.

CAUTION:
Be sure to tighten the mount ring completely. Incomplete tightening may result in the lens dropping off or disturbed back focus.

3-3 Attaching the Viewfinder

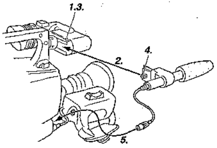


1. Loosen the stopper screw on the viewfinder.
2. Connect the connector.
3. Align the mounting guide with the camera's viewfinder mount base and attach the viewfinder.
4. Tighten the stopper screw.
5. Tighten the sliding securing ring.

* To detach the viewfinder, reverse the mounting procedure.

3-4 Attaching the Microphone (provided)

Provided Microphone

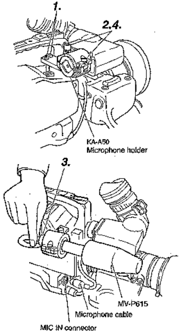


Connecting the provided microphone to the viewfinder.
The provided microphone is a phantom microphone.

1. Loosen the stopper screw on the viewfinder.
2. Attach the microphone to the attachment guide on the viewfinder as illustrated.
3. Confirm that there is no gap between the microphone and the viewfinder, and then tighten the stopper screw.
4. Tighten the microphone screw. The microphone should be firmly attached.
5. Connect the cable from the microphone to the MIC IN connector on the front section of the camera.
6. Secure the microphone cable using the cable clamp provided on the front side of the microphone holder.

CAUTION:
When this microphone is attached, the range that the viewfinder can be moved to the left will be reduced. Please purchase a separately sold microphone if you prefer to observe through the viewfinder using your left eye.

3-5 Attaching the Microphone (optional)



With the optional KA-A50 microphone holder, the optional microphones MV-P615 (Phantom microphone) can be used.

■ Attaching the Microphone with KA-A50

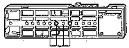
1. Secure the microphone holder with 2 screws.
2. Turn the small knob located on the outer side of the microphone holder anticlockwise to loosen it, and loosen the large knob located on the inner side in the same way. Rotate the large knob fully anticlockwise to open the holder.
3. Attach the microphone to the microphone holder so that the microphone does not interfere with the cassette cover.
4. Set the microphone holder so that the height is level, and tighten the inside and outside knobs to secure the microphone.
5. Connect the microphone cable to the MIC IN input connector.
   - When the microphone is connected to CH-1 AUDIO or CH-2 AUDIO connector on the rear panel, set the CH-1 or CH-2 Audio select switch according to the microphone used.
6. Secure the microphone cable using the cable clamp provided on the front side of the microphone holder.
7. Make sure to perform the correct settings for use of a phantom microphone.
   ☞ See "CAM MIC +48V" on page 77.

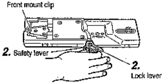
Note:
- When the light mounted on the camera is used at the same time, if the microphone in use has a long sound collecting section (ultra-directional type, etc.), the microphone's shadow may influence the image.

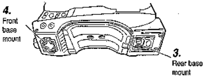
For servicing

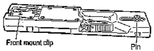
See the service manual page 1-16 "1.11.7 Tripod base".

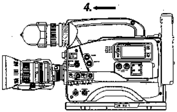
3-6 Attaching the Tripod Base (provided)











Use the provided tripod base to place the camera on a tripod.

1. Attach the tripod base on the tripod by using the hole that balances the unit most optimally.
2. While pushing the safety lever, pull the lock lever toward the front until the front mount clip clicks into place.
3. Place the unit on the tripod base by aligning the rear base mount of the unit with the pin on the tripod base.
4. Push the unit from the upward direction and slide it toward the front so that the front base mount of the unit is locked by the front mount clip of the tripod base as it clicks into place.

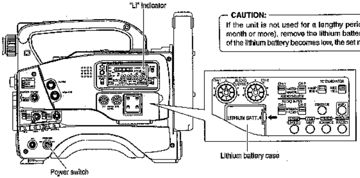
CAUTION:
- The front base mount may be locked while the pin of the tripod base is not inserted into the hole on the rear base mount of the unit. Therefore, after mounting, make sure that these parts are engaged properly.
- When moving the unit mounted on a tripod, any impact or vibration should be avoided as this may cause the unit to become detached and to drop from the tripod. Be sure to remove the unit from the tripod before transporting it.

3-7 Inserting and Replacing Backup Lithium Batteries

The GY-DV500 uses a lithium battery for backup of the time code data. Install the provided lithium battery before actually using the unit.

- **Lithium battery: CR2032**

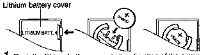
CAUTION:
If the unit is not used for a lengthy period of time (one month or more), remove the lithium battery. If the voltage of the lithium battery becomes low, the set may malfunction.



When the lithium battery is not in place or the battery is exhausted and requires a replacement, the "Li" indicator in the LCD display will light up.

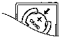
Replace lithium batteries with the POWER switch set to ON. Doing it with the POWER switch set to OFF will cause the loss of backup data.

■ How to Install the Lithium Battery



1. Push the lithium battery cover in the direction of the arrow as illustrated and remove the cover.
2. Slide the battery into place with its ⊕ marked surface facing upward.
3. Return the lithium battery cover to its original position in the unit.

■ How to Remove Lithium Batteries



- The lithium battery is easily removed if you press at the edge of the lithium battery at the place indicated in the illustration on the left and then pull the battery out.

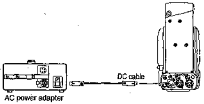
After replacing the lithium battery, set the date and time. To do this, see page 41 "Setting the Date and Time".

4. POWER SUPPLY

The GY-DV500 is operable with AC power supply or battery pack.

4-1 AC Operation

Use the JVC AA-P250 AC power adapter (max. rated output 12.5 V DC, 3.5 A) as the AC power supply.



Do not use any power source with large fluctuations in the power source voltage, or power sources generating noise, such as ripples.

1. After making sure that the power switches of the GY-DV500 and of the AA-P250 are set to OFF, connect the DC cable from the AA-P250 to the DC INPUT connector of the GY-DV500 as shown in the illustration.
2. When the AA-P250 is used, set the CHARGE/CAMERA switch to CAMERA.
3. Press the POWER switch of the GY-DV500 to ON. Power is supplied to the VCR section and the camera.
   * For details, read the instruction manual of the AA-P250.

Note:
Do not remove or connect the DC cable while recording is being performed.

4-2 Battery Pack Operation

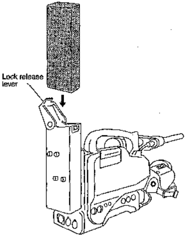
The GY-DV500 can be operated with the following battery packs.

- **Flat shape type battery pack**
- **Anton-Bauer battery pack**
  - Propack 13/14 Series
  - Trimpack 13/14 Series
  - Magnum 13/14 Series
  - Compack 13/14 Series

* An Anton-Bauer battery pack cannot be connected directly to the GY-DV500. It is necessary to mount the optional battery holder.
Battery holder: Anton-Bauer QRQ27
For details, see page 37 "Using an Anton-Bauer Battery Pack".

- When the DC cable is connected to the DC INPUT connector, the power supply from the battery pack is interrupted and the power starts to be supplied through the DC INPUT connector.
- Do not connect or disconnect the DC cable while operating with a battery pack.
  The following symptoms may occur if the DC cable is connected or disconnected while operating with a battery pack.
  - The power is cut off for a moment when the DC cable is disconnected.
  - Noise to the video and audio signals occurs. Audio signal are muted.
- When operation is continued with DC input after the battery pack capacity has been used up, set the POWER switch to OFF after the DC power is applied. Then switch ON again.
- If the GY-DV500 is left with the battery pack attached, a small amount of power is consumed even if the POWER switch on the GY-DV500 is set to OFF. Remove the battery pack when the GY-DV500 is not going to be used.

4-2 Battery Pack Operation (Cont'd)



Attaching a Flat Shape Type Battery Pack

1. Open the battery case cover while pushing the lock release lever.
2. Insert the battery pack into the battery case with its electrodes facing the unit.
3. Close the battery case cover.

Be sure to set the POWER switch to OFF before replacing the battery pack.

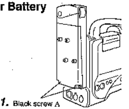
4-2 Battery Pack Operation (Cont'd)

Using an Anton-Bauer Battery Pack

To use an Anton-Bauer battery pack (Propack 13/14, Trimpack 13/14, Magnum 13/14, Compack 13/14 Series), it is necessary to detach the battery case from the GY-DV500 and replace it with the Anton-Bauer battery holder. Use the following battery holder.

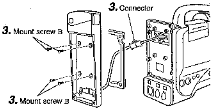
- Battery holder: Anton-Bauer QRQ27

Detaching the Battery Case From the GY-DV500 and Attaching The Anton-Bauer Battery



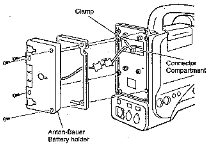
1. Remove the two black screws A on the battery case.

2. Remove the lower half of the battery case cover in the downward direction.



3. To remove the battery case, remove the four screws B fixing the battery case and the connector connecting the battery case to this unit.

Attaching the Anton-Bauer Battery Holder
Anton-Bauer Battery Holder

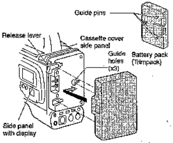


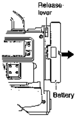
4. Connect the connectors protruding from the GY-DV500 with the connectors on the battery holder.
* Following connection of the connectors, insert them into the connector compartment and secure with the clamp.

5. Secure the battery holder to the GY-DV500 with the four mount screws provided with the battery holder.

* Take care not to pinch the wires. This could result in damage.

Attaching and Detaching an Anton-Bauer Battery Pack





Attaching the Battery Pack

1. Align the 3 guide pins of the battery pack with the guide holes on the battery holder, and push straight to insert the battery pack.
The battery cannot be attached properly if the guide pins are not inserted straight.

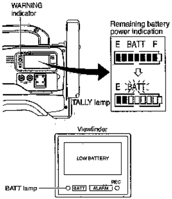
2. Slide the battery pack toward the side panel where the cassette cover is located until it clicks.
Now the battery pack has been attached.

Detaching the Battery Pack

- While pushing and holding the release lever, slide the battery pack toward the side panel where the LCD display is located, then pull the battery pack outward to remove.

4-2 Battery Pack Operation (Cont'd)

REMAINING BATTERY POWER DISPLAY



To display the remaining battery power accurately, set the VCR Setup Menu Item No. 396 BATTERY TYPE according to the type of the battery pack in use.
☞ See page 69.

The status of the remaining battery power can be checked by the Remaining Battery Power Display.
☞ See page 22.

- When the remaining battery power is nearly exhausted, the following warning messages will appear. In this case, replace with a fully charged battery as soon as possible.
- Remaining battery power indication:
  Segment bar and "BATT" indicator start to blink
- WARNING indicator and TALLY lamp blink
- Viewfinder:
  - BATT lamp and TALLY lamp blink
  - "LOW BATTERY" character indication (Status 0 or Status 1 mode)
- Alarm sound beeps

After the remaining battery power warnings appear, the GY-DV500 automatically stops operation if the battery power operation is continued.

Operating Time with Battery Pack

When the VF-P115B is used as the viewfinder and a fully charged battery pack is attached, the approximate continuous operating time is as follows:

Battery Pack	Continuous Operating Time (at 25 °C)
NP-1B	60 minutes
Magnum 14	130 minutes
NP-L40	80 minutes

- Battery operating time may differ depending on the number of times the battery has been charged, charging conditions and the operating environment, etc. Use the values in the table on the left for approximate reference times.
- Operating time is reduced in areas with a cold environment.
- Operating time is reduced when the power zoom lens is used frequently.

PRECAUTIONS FOR THE BATTERY PACK

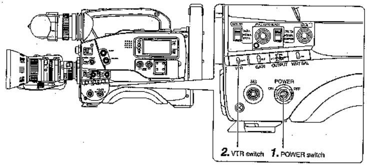
- When the battery pack is not in use, it must be stored in a cool, dry place.
  Do not leave the battery pack in a place where it might be subject to a high temperature (under direct sunlight in a car, etc.), this could cause leakage of the fluid or shorten service life.
- When the terminal section of the battery pack gets dirty, the operating time will be shortened.
- If the operating time becomes greatly reduced even immediately after recharging, the service life of the battery pack is nearly finished. Purchase a new battery pack.

Recharging

- Recharge the battery pack after completely discharging it. Repeated recharging with residual charge remaining could result in reduced battery capacity.
- If the battery capacity is reduced by repeating incomplete recharging, or recharging without discharging, once discharge the battery pack completely, then recharge it to restore the battery capacity.
- If the battery pack is recharged with its internal temperature raised immediately after use, recharging may not be performed completely.

5. PREPARATIONS

5-1 Turning the Power ON



1. Turn the POWER switch to ON.

- ■ The power is then supplied to the unit.
- Video image is output to the viewfinder.
- The display of the VCR section is turned on.

2. Select the GY-DV500 operation mode with the VTR switch.

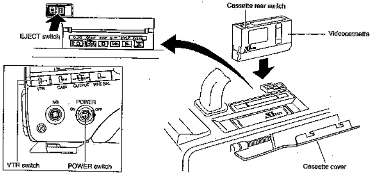
- The GY-DV500 operation mode may differ when the power is turned ON and when the cassette is loaded depending on the setting of the VTR switch as follows:

VTR switch setting	GY-DV500 operation mode
SAVE	GY-DV500 enters the SAVE mode (tape protect mode) and stops the drum motor. "SAVE" is displayed in the VCR operation indicating section of the Status 1 mode screen in the viewfinder. In this mode, the tape is effectively protected. In this condition, press the VTR trigger button to start recording. However, it takes longer for the operation to take place from this condition than from the STBY mode.
STBY	When a recordable videocassette is loaded, the GY-DV500 enters the record-pause mode automatically. (The drum motor is still rotating.) "STBY" is displayed on the Status 1 screen in the viewfinder. In this condition, pressing the VTR trigger button starts recording immediately.

CAUTION:

Wait at least 5 seconds before turning the power ON again once it has been turned OFF.
When the power is turned OFF, the unit automatically enters the tape protect mode. It takes approximately 5 seconds to enter the tape protect mode. Do not turn the power ON again within this interval.

5-2 Cassette Loading and Unloading



- A cassette cannot be loaded or unloaded while the GY-DV500 is in POWER OFF mode.
- Use a videocassette tape marked MiniDV.
- The videocassette should be held vertical and inserted straight into the slot.

Loading the Cassette

1. Set the POWER switch to ON.

2. Slide the EJECT switch to the side to open the cassette cover.

3. Insert a videocassette into the cassette slot after removing the tape slack.
Ensure that the videocassette is fully inserted.

⊙⊙ The cassette indicator on the display blinks during tape loading and lights steadily after the loading has been completed.

4. Slowly close the cassette cover by pushing it in all the way.
When the cassette cover is closed, the OPERATE LED lights up green and the unit is in the condition where it can be operated. In the SAVE mode, the OPERATE LED lights orange.

- The condition at the completion of loading varies depending on the position of the VTR switch and the switch on the back of the videocassette as shown below.

VTR switch	Switch on Back of Videocassette	
	REC	SAVE
STBY	Enters record-pause mode after back-spacing.	The unit enters stop mode. "REC INH" is displayed for a few seconds on the counter display.
SAVE	In the record-pause mode and the drum rotation is stopped.	

* Recording can be started by pressing the VTR trigger button from the record-pause condition. For details, see page 50 "Basic Record-ing Operation".

After the cassette cover is closed, it takes about 8 seconds before the unit can start recording or before it enters the stop mode.

CAUTION:

The GY-DV500 cannot be operated while the cassette cover is open. Make sure to close the cover before operating the unit.

Unloading the Cassette

1. Set the POWER switch to ON.

2. Slide the EJECT switch all the way to the side to start tape ejection.

⊙⊙ The cassette indicator on the display blinks during tape ejection and turns off after the ejection has been completed.

- It takes a few seconds before the cassette is ejected after the EJECT switch is moved.

3. Take out the videocassette.

4. Close the cassette cover.

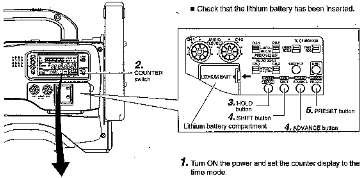
CAUTION:

Do not leave the unit for a long period with the cassette cover open as dirt or other foreign objects may enter the VCR section and cause malfunction.

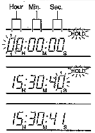
5-3 Setting the Date and Time

The date and time of the built-in clock should be set. During shooting, the date and time data are recorded in the sub-time code area on the tape.
During playback, the data are shown on the counter display. Powered by the backup lithium battery, the set date and time data continue to count even when the power is switched off.

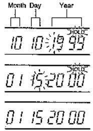
- Check that the lithium battery has been inserted.



Time display (COUNTER switch: TC)



Date display (COUNTER switch: UB)



1. Turn ON the power and set the counter display to the date/time mode.
- Set the VCR Setup Menu item No. 516 DISPLAY SELECT to "CLOCK".
  ☞ See "Displaying and Setting VCR Setup Menus" on page 67.
  ☞ See "VCR Setup Menu" on page 69.

2. Set the COUNTER switch to TC or UB.
- To set the time: Set the switch to TC.
  The time (Hour, Min., Sec.) is indicated on the counter display. (24-hour clock system)
- To set the date: Set the switch to UB.
  The date (Month, Day, Year) is indicated on the counter display.

3. Press the HOLD button to enter the setting mode.
The "HOLD" indicator lights up on the display to indicate that the unit is in the setting mode.
The leftmost digit on the counter blinks.

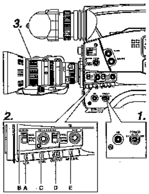
4. Set the date and time.
- Each time the ADVANCE button is pressed, the value of the blinking digit increases.
- Each time the SHIFT button is pressed, the digit to the right of the currently blinking one starts blinking. When pressed while the rightmost digit is blinking, the leftmost digit starts blinking again.
  Repeat the above procedure to set the value of all the digits.

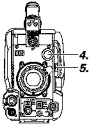
5. To decide the set date and time data, press the PRESET button.
The "HOLD" indicator on the display turns off and the date/time display stops blinking.
The time starts counting.

Memo:
To display and set the time code or user's bit, set the VCR Setup Menu item No. 516 DISPLAY SELECT to "TC".

6. SETTING AND ADJUSTMENTS BEFORE SHOOTING

6-1 Camera Settings





1. POWER ON
① First place a charged battery pack in the battery case on the rear section of the unit. If battery pack is not used, connect DC power to the DC INPUT connector on the rear section of the unit using the AC power adapter (AA-P250) to supply DC 12 V current.
② Set the POWER switch on the unit to ON.

2. SWITCH positions
A. Set the VTR switch to STBY.
B. AUTO IRIS switch; set to NORMAL.
C. GAIN switch; set to L. The L position is 0 dB.
D. OUTPUT switch; set to CAM/AUTO KNEE OFF.
E. WHT. BAL (Auto White Balance) switch; set to A or B.

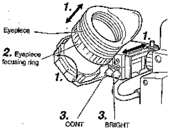
3. Set the lens' iris mode switch to "A" (AUTO IRIS side)

4. Choose the proper color temperature conversion filter.

	FILTER	Suitable Location
1	3200K	Indoors, dark outdoors
2	5600K	Outdoors
3	5600K+ND	Outdoors under clear sky

5. Using the SHUTTER dial, set the shutter speed to OFF.

6-2 Viewfinder Adjustment



1. Adjust the position and angle of the viewfinder.

2. Diopter adjustment

Rotate the eyepiece focusing ring until the viewfinder screen image is clearly visible.

3. Brightness and contrast adjustment

When the ambient brightness changes, etc., the brightness and contrast of the viewfinder screen can be adjusted with the BRIGHT and CONT controls.

6-3 External Monitor Adjustment

Display the camera built-in color bar signal on the video monitor and adjust the colors, contrast and brightness.

1. Connect a color video monitor to the MONITOR OUT connector of the GY-DV500.

2. Set the OUTPUT switch to BARS to output the color bar signal (SMTPE type color bars).

3. Set the monitor's BLUE CHECK function to ON so that the screen turns entirely blue.

4. Adjust the CHROMA control of the monitor so that there is no difference in brightness between the color bars 1 and 8 , 7 and D .

5. With the BLUE CHECK function ON, adjust the PHASE control of the monitor so that there is no difference in brightness between the color bars 3 and 0 , 5 and B .

6. If the phase control adjustment above causes a difference in brightness between the color bars 1 and 8 , 7 and D , start again from the CHROMA control adjustment in step **4**.

7. Set the monitor's BLUE CHECK function to OFF to switch the monitor back to the standard screen (R, G and B will all appear).

8. Use the monitor's brightness control to adjust so that the color bars H and I disappear but J is visible.

1. Connect a colour video monitor to the MONITOR OUT connector of the GY-DV500.

2. Set the OUTPUT switch to BARS to output the colour bar signal (EBU type colour bars).

3. Set the monitor's BLUE CHECK function to ON so that the screen turns entirely blue.

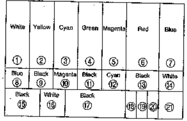
4. Adjust the CHROMA control of the monitor so that there is no difference in brightness between the colour bars 1 and 7 .

5. With the BLUE CHECK function ON, adjust the PHASE control of the monitor so that there is no difference in brightness between the colour bars 3 and 5 .

6. If the phase control adjustment above causes a difference in brightness between the colour bars 1 and 7 , start again from the CHROMA control adjustment in step **4**.

7. Set the monitor's BLUE CHECK function to OFF to switch the monitor back to the standard screen (R, G and B will all appear).

- SMTPE type color bars



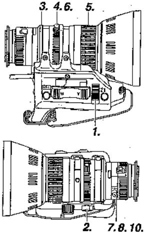
White ①	Yellow ②	Cyan ③	Green ④	Magenta ⑤	Red ⑥	Blue ⑦
Blue ⑧	Black ⑨	Magenta ⑩	Black ⑪	Cyan ⑫	Black ⑬	White ⑭
Black ⑮	White ⑯	Black ⑰			⑱ ⑲ ⑳	㉑

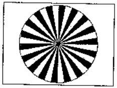
- EBU type colour bars

White	Yellow	Cyan	Green	Magenta	Red	Blue	Black
①	②	③	④	⑤	⑥	⑦	⑧

The colour bar screen has a configuration as shown above.
The description hereinafter refers to the positions in the colour bar screen using the numbers.

6-4 Back Focus Adjustment





Siemens star chart

It is only necessary to perform this when the lens is attached for the first time or when focusing is not correct in both the telephoto and wide-angle positions. Adjust the viewfinder for sharpness first.

It is easier to adjust back focus when the subject is more than 3 meters from the camera.
The optimal subject for this adjustment is a Siemens star chart.

1. Set the IRIS mode switch to M (Manual).

2. Set the zoom mode to MANU (Manual).

3. Open the iris ring. If the illumination is too strong, reduce it or move to a darker place.

4. Turn the zoom lever until the lens is at the maximum telephoto position.

5. Bring the subject into focus.

6. Set the lens to maximum wide-angle.

7. Loosen the back focus ring retaining knob.

8. View the same subject and adjust the back focus ring for the best possible focus.

9. Repeat steps **4.** through **8.** about three times for fine adjustment until the subject remains in focus in both the telephoto position and the wide-angle position.

10. Tighten the back focus ring retaining knob to secure the ring.

Memo:
ACCU FOCUS can also be used in the above step **3.**

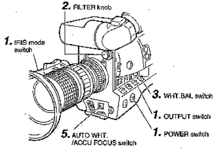
6-5 White Balance Adjustment

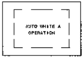
Since the color of light (color temperature) varies depending on the light source, it is necessary to re-adjust the white balance when the main light source illuminating the subject changes.

Note:
When a subject illuminated by a halogen lamp with a color temperature of 3,200K is shot while the color temperature conversion filter setting is set to 5,600K, a proper white balance adjustment and (FAW) Full Time Auto White balance may not be accomplishable. In this case, change the color temperature conversion filter setting to 3,200K and then carry out the white balance adjustment and (FAW) again.

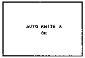
- Do not adjust using any highly reflective objects, such as metal, etc., as this may result in improper white balance adjustment.

WHITE BALANCE ADJUSTMENT

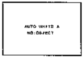




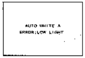
During operation



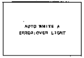
Result message



Improper object



Insufficient illumination



Excessive illumination

Two kinds of white balance adjustment results can be stored in memories AUTO1 and AUTO2.

■ **Adjustment procedure**

1. Set the following switches.
- Set the POWER switch to ON.
- Set the OUTPUT switch to CAM-AUTO KNEE OFF.
- Set the IRIS mode switch of the lens to A (Auto).

2. Set the FILTER knob according to the current lighting.

3. Set the WHT.BAL switch to A or B.

4. Place a white object near the centre of the screen under the same lighting conditions as the target subject and zoom in to fill the screen with white.

5. Tilt the AUTO WHT./ACCU FOCUS switch upward (to AUTO WHITE) once and release it.
"AUTO WHITE A, B OPERATION" is displayed in the viewfinder while the auto white balance adjustment circuit operates.
"AUTO WHITE A, B OK" is displayed when the white balance has been adjusted properly.

Error messages

- **NG: OBJECT (Improper object)**

  Displayed when there is not enough white color on an object or the color temperature is not suitable.
  Replace the color temperature conversion filter or use another white object and re-adjust the white balance.

- **ERROR: LOW LIGHT (Insufficient illumination)**

  Displayed when the illumination is dim. Increase the illumination and then re-adjust the white balance.

- **ERROR: OVER LIGHT (Excessive illumination)**

  Displayed when the light is excessively bright. Decrease the illumination and then re-adjust the white balance.

FULL-TIME AUTO WHITE BALANCE (FAW)

The FAW function adjusts the white balance value automatically as the lighting condition changes.

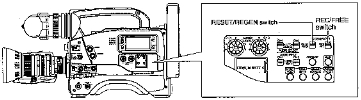
This mode is convenient when you have no time to adjust the white balance or when the camera is moved frequently in and out of places under different lighting conditions.

■ **Setting procedure**

The FAW function can be activated with item "FAW" on the OPERATION MENU.
This item allows allocation of the FAW function to one of the WHT.BAL switch positions, A, B or PRESET.
☞ See "OPERATION Screen" on page 73.

CAUTION:
- The FAW (Full-time Auto White balance) function cannot provide optimum white balance with a subject outside the FAW adjustment range, for example when it contains only a single color or not enough white color.
- The accuracy of the FAW (Full-time Auto White balance) is inferior to that of the manual white balance.
- When the power is turned on with the FAW mode selected, it takes about 10 seconds for the FAW adjustment to be completed. Do not shoot within this interval.

6-6 Switch Settings of the VCR Section



■ **Audio input signal selection**
Use the AUDIO INPUT switch to select whether the sound recorded on audio channel 1 or 2 is the sound from the microphone connector on the front section or the sound from the AUDIO INPUT connector on the rear section.
☞ See page 47.

■ **Audio recording level adjustment selection**
Select "AUTO" or "MANUAL" for the recording level adjustment mode for each audio channel.
☞ See page 48.

■ **VCR Setup Menu setting**

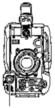
- REMOTE SELECT
  Confirm that "LOCAL" is selected if you want to operate on the GY-DV500 only.
- BACK TALLY MODE
  Select the lightning pattern of the BACK TALLY lamp.
- INPUT SELECT (U-ver. only)
  Select the input video signal. To record the GY-DV500's signal, set to "CAMERA". ☞ See page 68.
- LOW CUT IN
  For each audio input connector, select whether or not the lower frequency components of the audio signal are cut.
  Set to this position to eliminate the wind noise of the microphone.
- SAMPLING RATE
  Select the sampling rate for audio recording (48 kHz or 32 kHz).
- FRONT VOLUME ENABLE
  Set whether or not the front section's audio volume control should be used. The front section's audio volume control only affects the CH1 audio channel.
- LONG PAUSE TIME
  Select the time (in minutes) until the GY-DV500 enters the tape protection mode (drum rotation stops) when the record-pause mode is continued for long time.
- SSF MODE
  Select the mode of the S.S.F. (Super Scene Finder) function.
  S.S.F. function: Stores the time code of desired scenes or cue points in the unit's memory.
  ☞ See "How to Use the S.S.F. Function" on page 60.
- DISPLAY SELECT
  Select the counter display (time code or date/time indication) when the COUNTER switch is set to "TC" or "UB".

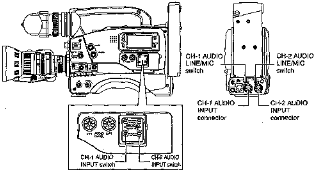
■ **Setting the time code recording function**
The GY-DV500 records SMPTE-standard time code for U-ver. or EBU-standard time code for E-ver. during recording. Set the switches according to applications.

- To record a time code as set in the built-in time code generator:
  - Set the PRESET/REGEN switch to PRESET.
  - Set the REC/FREE switch.
    If it is required to record continual time codes across different scenes, set the switch to REC.
  - VCR Setup Menu setting (U-ver. only)
    Select the time code generator's framing mode as drop frame or non-drop using the VCR Setup Menu item No. 416 "NON DROP/DROP".
- To record a time code in continuation of the existing time code on the tape:
  - Set the PRESET/REGEN switch to REGEN.

For details on the time code operations including time code presetting, see "TIME CODE OPERATION" on page 56.

6-7 Audio Input Signal Selection




CH-1 AUDIO LINE/MIC switch
CH-2 AUDIO LINE/MIC switch
CH-1 AUDIO INPUT connector
CH-2 AUDIO INPUT connector
CH-1 AUDIO INPUT switch
CH-2 AUDIO INPUT switch

The GY-DV500 is provided with the microphone connector on the front section and the two AUDIO INPUT connectors at the rear section for audio input.
On the other hand, two channels of sound can be recorded on the tape in digital PCM format.
Using the AUDIO INPUT switch, select for each channel (CH1 and CH2) whether the sound to be recorded should be the sound from the microphone connector on the front section or the sound from the AUDIO INPUT connectors on the rear section.

■ Selecting the CH-1 channel input sound

Make the selection using the CH-1 AUDIO INPUT switch.
FRONT : The sound from the microphone connector on the front section is recorded on the CH-1 channel.
REAR : The sound from the CH-1 AUDIO INPUT connector on the rear section is recorded on the CH-1 channel.

■ Selecting the CH-2 channel input sound

Make the selection using the CH-2 AUDIO INPUT switch.
FRONT : The sound from the microphone connector on the front section is recorded on the CH-2 channel.
REAR : The sound from the CH-2 AUDIO INPUT connector on the rear section is recorded on the CH-2 channel.

■ Selecting the front section's microphone connector

A microphone (phantom microphone, etc.) requiring +48 V power supply or other type of camera microphone (monaural) can be connected.

- In accordance with the connected microphone, specify the phantom microphone or other type of microphone using the Camera Setup Menu item CAM MIC +48V.
- The reference input level is -60 dBs.

■ Selection of rear audio input connectors

Select the audio signal input to the AUDIO INPUT connector using the [LINE/MIC] switch. Make settings for the CH-1 and CH-2 AUDIO IN connectors separately.

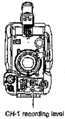
LINE : Set to this position when connected to audio equipment, etc.
The reference input level is +4 dBs.

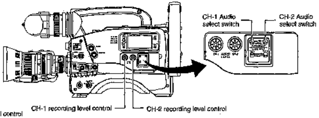
MIC : Set to this position when using a monaural microphone.
The reference input level is -60 dBs.

MIC +48 V : Set to this position when a microphone (phantom microphone) requiring +48 V DC power supply is connected.

CAUTION:
When connecting a component that does not require +48 V power supply, make sure that the LINE/MIC switch is not set to MIC +48V.
When using the microphone on the front section, set the Camera SETUP screen item "CAM MIC +48V" to "OFF".
Neglecting this could cause damage to the connected component. ☞ See page 77.

6-8 Recording Level Adjustment





For each audio channel, use the AUDIO SELECT switches to select whether the recording level adjustment should be set to AUTO mode or MANUAL mode.

- When set to AUTO: Recording level is fixed. In this mode, the recording level control does not function.
- When set to MANUAL: Recording level can be adjusted using the recording level controls for each audio input.

■ Adjusting the recording level control of the front section

The recording level control on the front section only affects the CH-1 channel sound.
To use the recording level control on the front section, make the following settings.

- Set the CH-1 AUDIO SELECT switch to MANUAL.
- Set the VCR Setup Menu item No. 246 FRONT VOLUME ENABLE to "ENABLE".

CAUTION:
The recording level controls on the side section work regardless of the setting of the VCR Setup Menu Item No. 246 FRONT VOLUME ENABLE. ☞ See page 68.

Manual Adjustment of Recording Level

The recording level can be adjusted manually when the GY-DV500 is in the record, record-pause or stop mode.

1. Set the AUDIO SELECT switch of the channel whose recording level that you want to adjust manually to MANUAL.

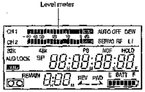
2. Rotate the recording level control corresponding to the audio input to be adjusted.
- Adjust so that the peak level does not exceed the -3dB point when a loud sound is input.
- With microphone input, since the limiter circuit is activated, the recording level will not exceed 0 dB even if the recording level control is turned up.

■ How to use the recording level control on the front section

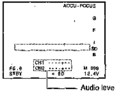
① Set the recording level control on the front section to maximum (10) position.

② Initially, adjust the recording level using the CH1 recording level control on the side.

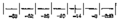
③ When a loud sound is input during recording, use the recording level control on the front section to lower the recording level.



Viewfinder Status 1 Mode

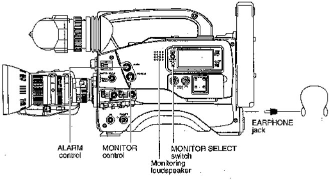


Indicator level (reference)



CAUTION:
When the AUDIO INPUT LINE/MIC switch on the rear section is set to MIC, be sure to check that the microphone is connected to the AUDIO INPUT connector. If the microphone is not connected, increasing the recording level could cause noise from the input connector to be recorded on the tape. When the microphone is not connected to the AUDIO INPUT connector on the rear panel, set the LINE/MIC switch to LINE or turn down the recording level control.

6-9 Monitoring Audio during Recording



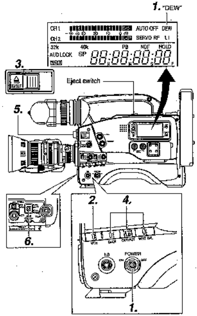
The audio input during recording, in record-pause or stop mode can be monitored through the monitoring loudspeaker or earphone.

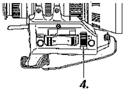
- The monitoring audio is not output from the loudspeaker while the EARPHONE jack is in use.
- Select the audio channel to be monitored using the MONITOR SELECT switch.
  CH-1 : The sound input to the CH-1 channel is output.
  MIX : The sound input to the CH1 and CH2 channels is output mixed.
  CH-2 : The sound input to the CH-2 channel is output.
- The MONITOR volume control adjusts the monitoring volume.
- The loudspeaker or earphone outputs an alarm tone in the case of an abnormal condition occurring in the unit.
  An alarm tone is also output when the tape end is reached or when the battery is running down. The alarm tone volume can be adjusted with the ALARM control. For details on the alarm tone, see page 87.

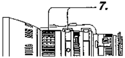
* Do not increase the audio monitoring volume excessively; otherwise howling with the camera microphone may occur.

7. SHOOTING OPERATION

7-1 Basic Recording Operation







1. Set the POWER switch to ON.

Power is supplied to the unit.
Check that the condensation indicator "DEW" does not appear on the display. If it is lit, wait until the indicator goes out.

2. Set the VTR switch to the STBY position.

Even when the VTR switch is set to the "SAVE" position, pressing the VTR trigger button will start recording. However, in this case, it is necessary to wait a short time until the recording actually starts.
For details on the VCR SAVE mode, see page 52.

3. Slide the EJECT switch to open the cassette cover.

- Ensure that the switch on the back of the videocassette is set to REC and insert the cassette correctly.
  When the cassette is inserted, the tape is loaded and the unit enters the record-pause mode.
- Slowly close the cassette cover.

- Use a videocassette marked MiniDV.
- If the cassette cover is not closed, the GY-DV500 will remain inoperative.
- At the loading time and power switch set to on time, the built-in head cleaner will emit a sound while operating. This does not indicate a malfunction.
- After the cassette cover is closed, it takes about 8 seconds before the unit is ready for recording.

4. Set the switches as required.

- GAIN : Sensitivity suitable for the subject
- OUTPUT : "CAM/AUTO KNEE ON"
- WHT-BAL : "A" or "B"
- Set the IRIS switch of the lens to "A".

5. Select the FILTER according to the lighting condition.

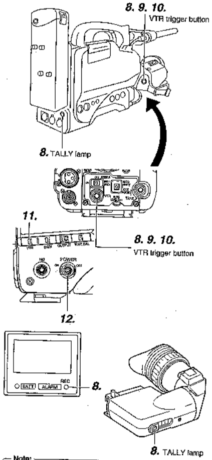
Position 1 (3200K) : For shooting indoors or outdoors when illumination is not sufficient
Position 2 (5600K) : For shooting outdoors
Position 3 (5600K + ND): For shooting outdoors under a clear sky.

6. Adjust the white balance.

☞ See "White Balance Adjustment" on page 45.

7. Point the camera at the subject and determine the angle of view and focus with the zoom lever and the focusing ring.

7-1 Basic Recording Operation (Cont'd)



8. Press the VTR trigger button on the GY-DV500 or lens to start recording.
Once recording has started, the BACK TALLY lamp on the rear section of the unit and the tally lamp on the viewfinder light red, and the REC indication in the viewfinder lights green.

> **Note:**
> * The lightning conditions of the BACK TALLY lamp on the rear section of the unit can be changed by setting the VCR Setup Menu item No. 082 BACK TALLY MODE.
> * The lamp in the viewfinder and on the front section will blink from when the button is pressed and until recording actually starts. ☞ See page 68.

9. To stop recording, press the VTR trigger button again. The TALLY lamp and REC indicator lamp go out and the unit enters the record-pause mode.
When the VTR trigger button is pressed, the unit enters the record-pause mode after rewinding the tape for about 2 seconds (back-spacing).

10. To restart recording:
Press the VTR trigger button on the GY-DV500 or lens.

11. Ending recording:
Enter record-pause mode and perform the following operations as required.
- When it is required to unload the videocassette:
  - Slide the EJECT switch.
- When it is required to put the unit in save mode:
  - Set the VTR switch to SAVE.
    Drum rotation stops and the GY-DV500 enters the tape protection/power-saving mode.

12. When shooting is completely finished, eject the cassette and set the POWER switch to "OFF".
When the unit is not going to be used for a long period, detach the battery pack.

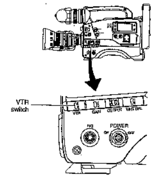
About the QUICK REC Mode

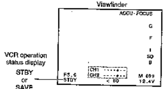
If the VTR trigger button is pressed immediately after the videocassette is inserted, the mode becomes the QUICK REC mode that enables quick start of recording.
However, when shooting starts in the middle of the tape, a blank space appears as the new scene will not be linked smoothly with the previous image.
Also, the time code does not continue. (Some overlap may also occur.)

Note:
- The unit enters stop mode at tape-end automatically, and if kept longer than 3 or 30 minutes in this mode, SAVE mode is maintained. ☞ See "Menu No. 307: LONG PAUSE TIME" on page 69.
- If the VTR trigger button is pushed very quickly and repeatedly, or the POWER switch is moved immediately after being pressed, the viewfinder REC indicator lamp may blink and the GY-DV500 may not enter the record mode. To remedy this condition set the POWER switch to OFF and wait for 5 seconds or more before turning the power on again.
- A neat transition to the next recorded scene cannot be guaranteed if you end a recording by turning the POWER switch or DC power supply OFF, or by removing the battery pack.
- Before recording a scene that is particularly important, perform test shooting to ensure that normal recording is possible.
- The power consumption can be reduced by setting the LIGHT switch on the display and TALLY lamp to OFF.
- The microphone may pick up the sound of the lens' iris if the iris is changed abruptly or the iris is manually moved abruptly during recording. If you find the noise annoying, please purchase an optional microphone in order to move the microphone away from the lens or ensure that the iris is not changed abruptly during shooting.

For servicing
The QUICK REC mode of this unit is different from conventional models such as (GY-X1, GY-X2, and GY-X2B). It is not a fully automatic mode operation. In this case it is a function that shortens the time to the initiation of the start of the recording.

7-2 VCR Save Mode





(Status 1 mode)

When a recordable videocassette is loaded, the GY-DV500 enters the record-pause mode. However, the record-pause operation condition differs depending on the setting of the VTR switch.

- **VTR switch setting**

STBY : The GY-DV500 enters the record-pause mode, and the drum is rotating at this time. (Standby mode)
The "STBY" indicator appears in the VCR operation status display in the viewfinder (in Status 1 mode).
• In this condition, recording starts immediately when the VTR trigger button is pressed.

SAVE : The GY-DV500 enters the record-pause mode but the drum is not rotating. (Save mode).
The tape is protected.
The "SAVE" indicator appears in the viewfinder (in Status 1 mode).
The OPERATE indicator lights orange. The display backlight turns off.

> **Note:**
> When the VCR Setup Menu item No. 396 SSF MODE is set to the CUE MODE or MARK mode, the VCR save mode is not entered.

Recording from the Save mode

- In the save mode, pressing the VTR trigger button will start recording.
  However, in this case, it takes several seconds before the GY-DV500 starts recording.
- Pressing the VTR trigger button again interrupts the recording and the GY-DV500 enters the save mode again.

7-3 If Unit is Left in Record-Pause (Standby) Mode

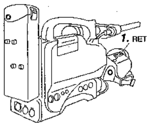
When the GY-DV500 has remained in record-pause (standby) mode for about 30 minutes, the unit enters the save mode, in which the drum rotation is stopped automatically and the tape tension is released. (Save mode)

- To start recording from the save mode, press the VTR trigger button; the drum starts to rotate and recording starts in about 3 seconds.
- To return to the record-pause mode from the save mode, press the VTR trigger button TWICE; the drum starts to rotate.

> • The time until the unit enters the save mode after it is placed in record-pause mode can be set to 3 minutes or 30 minutes with the VCR Setup Menu item No. 307 LONG PAUSE TIME.
> When used in a cold environment, the setting will be 3 minutes regardless of the setting on the VCR Setup Menu.
> ☞ See page 69.

For servicing
See the service manual page 2-7 "2.4.3 Cleaning".

7-4 Checking Recorded Contents in Record-Pause Mode (Recording Check Function)



The recording check function is only valid in the standby mode (VTR switch set to STBY).
In the record-pause mode, approximately 2 seconds of the last recorded portion can be played back.

- The recorded contents can be checked in the viewfinder or on a monitor connected to the MONITOR OUT or Y/C OUT connectors.
- In the viewfinder or on the monitor connected to the MONITOR OUT or Y/C OUT connectors, the video image from the VCR section is output.

1. In the record-pause mode, press the **RET** button on the camera lens section.
  - The tape is slightly rewound and played back for approximately 2 seconds.
    After playback is finished, the tape returns to the position at which the RET button is pressed and the record-pause mode resumes.

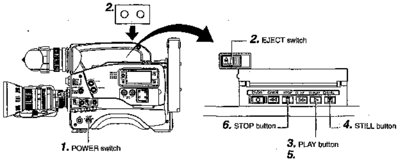
■ When the RET button is kept pressed, the tape is rewound and played back for approximately 10 seconds at maximum.
- While the RET button is pressed, the record-mode is not entered even if the VTR trigger button is pressed.

- This function does not work when the GY-DV500 is in the save mode or stop mode.
- During recording check, the following indications will appear if the error rate increases due to head clogging, etc.
  - "RF" appears on the display panel.
  - "HEAD CLOG" appears on the counter display.
  - "VTR WARNING (HEAD)" appears in the viewfinder.

See the instructions page 8 "Head Cleaning".

8. PLAYBACK MODE

8-1 Playback Procedure



Operation

1. Set the POWER switch to ON.

2. Load the recorded videocassette correctly.
- Slide the EJECT switch to the side. When the cassette cover opens, insert the videocassette and then close the cassette cover again.

■ When a recordable videocassette (with the switch on the back of the cassette set to REC) is loaded, the unit enters the record-pause mode (STBY mode).
In this case, press the STOP button to release the record-pause mode.

3. Press the PLAY button.
➡ The PLAY indicator lights and playback starts.

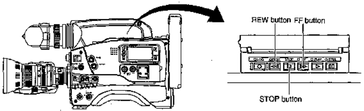
4. Press the STILL button to stop playback temporarily.
➡ The STILL indicator lights and the unit enters the still mode.

5. To re-start playback, press the PLAY button.
➡ The STILL indicator goes out and playback starts again.

6. To stop playback, press the STOP button.
➡ The PLAY indicator goes out and the unit enters the stop mode.

CAUTION:
- When the still picture mode or stop mode has continued for about 30 minutes, the unit automatically switches to the save mode to protect the tape.
  The time until the tape protect mode is initiated can be set to 3 or 30 minutes with the VCR Setup Menu item No. 307 LONG PAUSE TIME.
  When used in a cold environment, the setting will be 3 minutes regardless of the setting on the VCR Setup Menu.
- Noise may appear in the picture during still mode. This does not indicate a malfunction.
- When the automatic tracking function is activated at the start of the playback mode, digital noise may appear on the playback image. This does not indicate a malfunction.
- This unit does not allow manual tracking adjustment.
- When playing back a tape recorded on another unit, digital noise may appear during playback. This does not indicate a malfunction.
- Following the loading, the built-in head cleaner will emit a sound while operating. This does not indicate a malfunction.

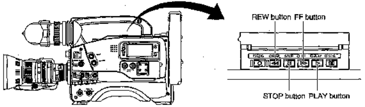
8-2 Fast-Forward, Rewind



- ■ Press the FF button in stop mode to fast forward the tape. Press the REW button in stop mode to rewind the tape.
- ■ Press the STOP button to stop fast forwarding or rewinding.

- When the tape approaches the end during fast forwarding or rewinding, the tape speed decelerates to protect the tape.
- The time required for fast forwarding and rewinding may become longer when used in a cold environment. This is not a malfunction.

8-3 Search



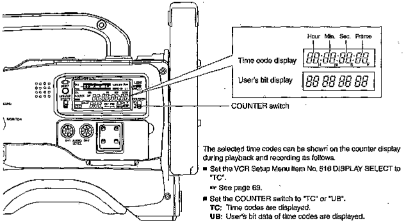
- ■ Press the FF button in play mode to search the tape in the forward direction at about 10 times the normal speed.
  - Press the REW button in play mode to search the tape in the reverse direction at about 10 times the normal speed.
- ■ Press the PLAY button to resume normal playback.
- ■ Press the STOP button to stop.

- The audio is reproduced during the search.
- Video noise may be observed or the image may become unstable during the search, but this is not a malfunction.

9. TIME CODE OPERATION

The GY-DV500 records SMPTE-standard time codes for U-ver. or EBU-standard time codes for E-ver. and user's bits. In the play or the record mode, the reproduced time codes or user's bits are shown on the counter display.
- Time code data cannot be output through the unit's connectors.

9-1 Displaying Time Code

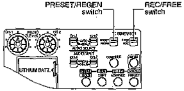


The selected time codes can be shown on the counter display during playback and recording as follows.

- ■ Set the VCR Setup Menu item No. 516 DISPLAY SELECT to "TC".
  ☞ See page 69.
- ■ Set the COUNTER switch to "TC" or "UB".
  TC: Time codes are displayed.
  UB: User's bit data of time codes are displayed.

9-2 Presetting and Recording of Time Code

The time code or user's bit data to be recorded onto the tape can be preset to a desired value.



U-ver. only

Drop frame/Non-drop frame mode
In the NTSC system, the actual number of frames per 1 second is approximately 29.97 frames, but the number of frames that becomes the processing referance of the time code is 30 frames. To compensate for this difference, the mode called drop mode drops frame 00 and 01 for every minute that cannot be divided by 10.
The non-drop frame mode is when no frames are dropped and the actual time shift is neglected.

Note:

When the VCR Setup Menu Item No. 398 SSF MODE is set to CUE MODE or MARK MODE, the time code generator's running method is internally set to the REGEN mode.
If No. 398 SSF MODE is not set to OFF, the time code cannot be preset.

■ Setting the time code related switches

- Set the PRESET/REGEN switch to "PRESET".
- Set the REC/FREE switch.
  REC : The data preset in the time code generator runs only during recording.
  Use this setting if it is required to record continual time codes across different scenes.
  * However, approximately ±1-frame variations may occur in scene transition accuracy.
  FREE : The time code starts to run from the time it is preset in the time code generator.

■ Setting the VCR Setup Menu (U-ver only)

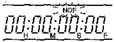
- Set the VCR Setup Menu item No. 516 DISPLAY SELECT to "TC".

Select the time code generator's framing mode using the VCR Setup Menu item No. 416 NON DROP/DROP.

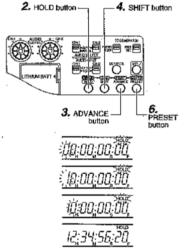
DROP : The time code generator's running method is set to the drop frame mode.
Use this setting when placing emphasis on the recording time.
The "DF" indicator lights up on the display in the drop-frame mode.

NON DROP : The time code generator's running method is set to the non drop frame mode.
Use this setting when placing emphasis on the number of frames.

In the NON DROP frame mode, the "NDF" indicator lights on the display.



TIME CODE PRESETTING PROCEDURE (for U-ver.)



1. Display the time code on the counter display.
Set the COUNTER switch to "TC".
- Time code up to 23 hrs. 59 min. 59 sec. 29 frames can be preset.

2. Place the time code generator in preset mode.
Press the HOLD button.
- The "HOLD" indicator lights on the display to indicate the preset mode. The first digit of the counter display blinks.

3. Set the value of the blinking digit.
Press the ADVANCE button.
- The value of the blinking digit changes.

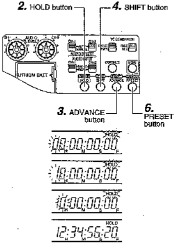
4. Change the blinking digit.
Press the SHIFT button.
- The blinking digit changes.

5. Set the desired value for all digits.
Repeat steps **3.** and **4.** for each digit.

6. Preset the set data in the memory.
Press the PRESET button.
- The set data is saved as the time code generator value. Following the above operation, the "HOLD" indicator disappears from the display, the counter stops blinking and the time code is preset.
- If the REC/FREE switch is set to FREE, the time code starts to run.

■ If you preset a wrong time code, perform steps ***2. 3. 4. 5.*** and ***6.*** again.

TIME CODE PRESETTING PROCEDURE (for E-ver.)



1. Display the time code on the counter display.
Set the COUNTER switch to "TC".
- Time code up to 23 hrs. 59 min. 59 sec. 24 frames can be preset.

2. Place the time code generator in preset mode.
Press the HOLD button.
- The "HOLD" indicator lights on the display to indicate the preset mode. The first digit of the counter display blinks.

3. Set the value of the blinking digit.
Press the ADVANCE button.
- The value of the blinking digit changes.

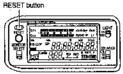
4. Change the blinking digit.
Press the SHIFT button.
- The blinking digit changes.

5. Set the desired value for all digits.
Repeat steps **3.** and **4.** for each digit.

6. Preset the set data in the memory.
Press the PRESET button.
- The set data is saved as the time code generator value. Following the above operation, the "HOLD" indicator disappears from the display, the counter stops blinking and the time code is preset.
- If the REC/FREE switch is set to FREE, the time code starts to run.

■ If you preset a wrong time code, perform steps ***2. 3. 4. 5.*** and ***6.*** again.

PRESETTING USER'S BIT DATA



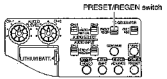
- Pressing the RESET button in the preset mode resets the time code or user's bit data to 00 00 00 00.
- If you press the HOLD button by mistake, press the HOLD button once more to return to the previous display.

■ Display user's bit data on the counter display and perform the same procedure as the time code presetting procedure.
- The user's bit can be specified using numerals or alphabetic letters from 0 to F for each digit.

Note:
Do not specify F in the user's bit data.
Specification of F results in a special setting and reading of user's bit data during playback may become impossible.
If all user's bit digits are set to F, the data cannot be read.

9-3 Recording Time Codes in Continuation of Time Codes Recorded on Tape

The GY-DV500 also incorporates a time code reader. Therefore, when the unit enters record mode from record-pause mode, it can read the time code data recorded on the tape and record time codes in continuation of the existing data. The recorded user's bit data is identical to the user's bit data recorded on tape.
* However, approximately ±1-frame variations may occur in scene transition accuracy.
To enable this, set the time code related switches as follows before starting recording.



Setting

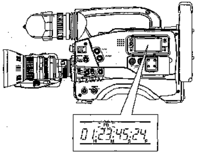
■ Set the VCR Setup Menu item No. 516 DISPLAY SELECT to "TC".
☞ See page 69.

■ Set the counter display to show time codes or user's bit data.

■ Set the PRESET/REGEN switch to REGEN.
- The time code run mode becomes unrelated to the REC/FREE switch settings.
- The time code framing mode automatically becomes the mode (drop frame or non drop frame) already recorded on the tape.

9-4 Reproducing Time Codes

The GY-DV500 incorporates a time code reader. During playback, the time code or user's bit data recorded on the tape is displayed on the counter display.


PB
0 1:23:45:24
H M S F

- ■ Set the VCR Setup Menu item No. 516 DISPLAY SELECT to "TC".
  ☞ See page 69.
- ■ Set the counter display to indicate time code or user's bit data.
- ■ Reproducing time codes
  Press the PLAY button.
  - The "PB" indicator lights up on the display and the time code or user's bit data are indicated.

- When passing sections where the time code does not continue during playback, the time code stops running. The playback mode continues.

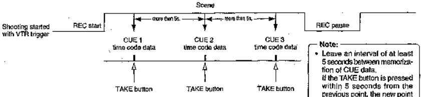
Note:
When a tape containing more than two hours of recorded time codes is played back on DV video equipment for normal consumer use, the time code may not be played back correctly.

10. S.S.F. (Super Scene Finder) FUNCTION

10-1 Explanation of the S.S.F. Function

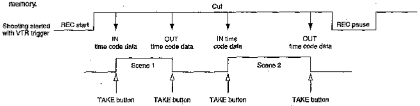
During recording, the SSF function records the time code data at the point of time of a desired recorded scene in the unit's memory. Using the S.S.F. data stored in memory during after-processing of the recorded image allows efficient use of the tape.
The S.S.F. function comprises the two modes CUE and MARK. Select the mode using the VCR Setup Menu item No. 398 S.S.F. MODE.
When the VCR Setup Menu item No. 398 SSF MODE is set to CUE MODE or MARK MODE, the time code generator's running method is internally set to the REGEN mode.
When shooting in either of the modes, the time code data is stored in the unit's memory when the TAKE button on the front section is pressed.

■ CUE Mode:
When the TAKE button is pressed at the desired scene during shooting of a given cut, the time code data at that point is stored as CUE data in the unit's memory.


Scene
Shooting started with VTR trigger
REC start
more than 5s.
more than 5s.
REC pause
CUE 1 time code data
CUE 2 time code data
CUE 3 time code data
TAKE button
TAKE button
TAKE button

Note:
- Leave an interval of at least 5 seconds between memorization of CUE data.
  If the TAKE button is pressed within 5 seconds from the previous point, the new point is not memorized.
- In the CUE mode, the REC start/pause time code data have an error margin of approximately 3 frames.

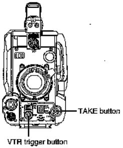
■ MARK MODE
During shooting of a given cut, press the TAKE button at beginning of a desired scene and then press the TAKE button again at the ending of the scene.
The time code data at the point where the TAKE button is pressed first becomes the start point of the scene and time code data at the point where the TAKE button is pressed the second time becomes the ending point, and both are stored in the unit's memory.


Cut
Shooting started with VTR trigger
REC start
REC pause
IN time code data
OUT time code data
IN time code data
OUT time code data
Scene 1
Scene 2
TAKE button
TAKE button
TAKE button
TAKE button

- In the MARK mode up to 119 scenes can be stored in memory. When the memory becomes full, the indication showing the number of recorded scenes on the viewfinder screen becomes "M: - - -".
  However, if mixed with the CUE mode, the maximum number of scenes that can be stored decreases for each scene.
- In the CUE mode up to 237 points can be stored in memory.
  However, for each REC start/stop the maximum number of points that can be stored decreases by two points for each scene.
  The same is true when the CUE mode is mixed with the MARK mode.
- When the videocassette is replaced, new S.S.F. data is generated. S.S.F. data for six videocassettes can be stored in the internal memory.

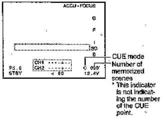
Note:
- Be sure to record S.S.F. data continuously on the same tape. It is not possible to rewind the tape for overwriting during the recording.
  If the tape is rewound in the middle of a recording, or after similar operation is performed, be sure to use the Scene End Cue Up function in order to ensure that new data are recorded in continuation of the existing data.
  ☞ See page 63.
- In the S.S.F. mode, the VTR save mode is not activated.

10-2 How to Use the S.S.F. Function



CUE Mode

1. Set the S.S.F. mode as CUE mode.
Set the VCR Setup Menu Item No. 398 S.S.F. MODE to "CUE".
☞ See page 69.
- The CUE mode is indicated in the lower part of the Status 1 screen in the viewfinder.


ACCU • FOCUS
G
F
I
SD
B
F5.6
STBY
CH1
CH2
< 60
C 099
12.4V
CUE mode
Number of memorized scenes
* This indicator is not indicating the number of the CUE point.

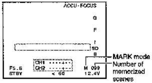
2. Press the VTR trigger button to start the recording.

3. When you reach the point that you want to memorize as the CUE point, press the TAKE button.
- The time code data of the point where the TAKE button is pressed is stored in the unit's memory as CUE data. The LOG button's LED lights during memorization of the CUE point and the "*" mark is shown in the viewfinder.
- ■ Press the TAKE button each time you reach a point that you want to memorize as CUE data.

4. Stop the recording.
Press the VTR trigger button.

MARK Mode

1. Set the S.S.F. mode as MARK mode.
Set the VCR Setup Menu item No. 398 S.S.F. MODE to "MARK".
☞ See page 69.
- The MARK mode is indicated in the lower part of the Status 1 screen in the viewfinder.



2. Press the VTR trigger button to start the recording.

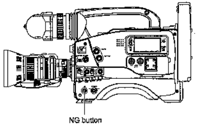
3. When you reach the scene that you want to memorize, press the TAKE button.
- The time code data of the point where the TAKE button is pressed is stored in the unit's memory as the start point of the scene.

4. When you reach the scene that you want to memorize as the ending point, press the TAKE button again.
- The time code data of the point where the TAKE button is pressed is stored in the unit's memory as the ending point of the scene.
- The LOG button's LED lights during memorization of the IN point and the "*" mark is shown in the viewfinder. The LOG button's LED remains off during memorization of the OUT point and the "*" mark is not shown in the viewfinder.
- ■ For each scene that you want to memorize, repeat steps 3. and 4.

5. Stop the recording.
Press the VTR trigger button.

Note:
- Once the S.S.F. data has been written to a videocassette, it is not possible to record S.S.F. data to the tape again.
- Once a tape with recorded S.S.F. data is rewound but not ejected before playback or recording is performed on it again, the previous S.S.F. data cannot be automatically erased when S.S.F. data are recorded (when you overwrite the previous image). Therefore, the S.S.F. data of the overlapped sections will not correspond to the video image.
Furthermore, please note that the time code data may differ from the actual data if recording is started in the CUE mode in this situation.

10-3 Deleting S.S.F. Data

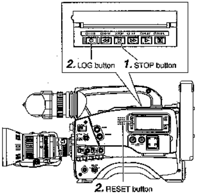


The S.S.F. data recorded in the unit's memory can be deleted in the record mode and the record-pause mode.
This function is only valid in the MARK mode.

- ■ In the record mode, press the NG button after the IN point has been stored or after the scene has been stored.
  - The S.S.F. data of the cut that you are currently shooting is deleted.
When the NG button is pressed after the IN point has been stored, the scene number is not updated.
  - * The S.S.F. data of previous cuts are not deleted.
- ■ In the record-pause mode, press the NG button.
At the point when the TAKE button is used to store the next scene, the S.S.F. data of the immediately preceding cut is deleted.

Note:
The NG button is only valid for the immediately preceding scene. The erase of scene data by the NG button cannot be confirmed on the unit.

10-4 Resetting S.S.F. Data



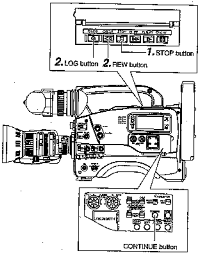
Operation

1. Press the STOP button to enter the stop mode.

2. Press the RESET button while the LOG button is kept pressed.
- All the S.S.F. data held in the memory are erased. However, the reel number is not cleared.

Note:
The unit is not provided with a function for reading out the S.S.F. data from a tape.
Necessary data should be moved to another device before resetting. Also, to read out the S.S.F. data from a tape, please use the optional DV Videocassette Recorder BR-DV600.

10-5 Writing S.S.F. Data to Tape



S.S.F. data stored in the unitís memory can be written to the beginning of tape.

Operation

1. Press the STOP button to enter the stop mode.
2. Press the REW button while the LOG button is kept pressed.
   - The REW indicator blinks during tape transport in the writing position.
   - The LOG indicator lights while S.S.F. data are being written to the tape.
   - When writing to the tape is completed, the LOG indicator goes out.

About the Scene End Cue Up Function

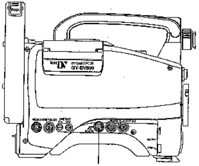
- ■ When the CONTINUE button is pressed while the LOG button is kept pressed in the stop mode, the tape winds to the S.S.F. data's last OUT point, after which the unit enters the record-pause mode. (Scene End Cue Up) The FF button's LED blinks during the Scene End Cue Up mode.

Note:

Once a tape with recorded S.S.F. data is ejected and then reinserted again, the previous data will be erased if new S.S.F. data are recorded on the tape.

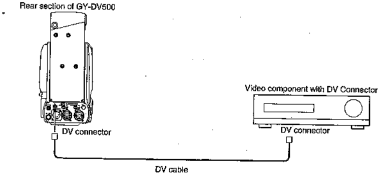
10-6 Outputting S.S.F. Data

The S.S.F. data stored in the unit's memory can be output by RS-232C control via the VTR REMOTE connector.



11. USING EXTERNAL COMPONENTS

11-1 Connecting a Video Component with DV Connector



Connection

Connect the DV connector on the GY-DV500 to the DV connector on the video component using the DV cable.

Settings

- ■ Recording the image of the video component with DV connector on the GY-DV500
- • To input the image via the DV connector, set the VCR Setup Menu item No. 126 INPUT SELECT to "IEEE1394".
  - • Settings cannot be changed during recording.

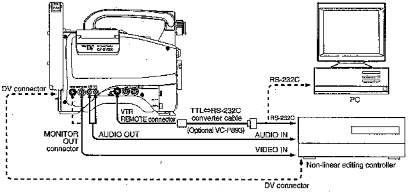
☞ See page 68.

U-ver. only

- ■ Recording the playback image or audio of the GY-DV500 on the video component with DV connector
- • To remote control the playback operation of the GY-DV500 from the video component with DV connector, set the VCR Setup Menu item No. 050 REMOTE SELECT to "IEEE1394".

☞ See page 68.

11-2 Connecting a PC


DV connector
MONITOR OUT connector
AUDIO OUT
VTR REMOTE connector
TTL⇔RS-232C converter cable
(Optional VC-P893)
RS-232C
PC
RS-232C
AUDIO IN
VIDEO IN
Non-linear editing controller
DV connector

Connections

Connect the GY-DV500's VTR REMOTE connector to the RS-232C connector on the PC or the non-linear editing controller using the TTL ⇔ RS-232C converter cable.
Or connect the GY-DV500's DV connector and the DV connector of the non-linear editing controller using a DV cable.
For compatible non-linear editing controller, consult with your JVC dealer.

Settings

- To remote control the PC or non-linear editing controller by means of RS-232C, set the VCR Setup Menu item No. 050 REMOTE SELECT to "RS232C". ☞ See page 68.
- To remote control the GY-DV500's VCR using the DV connector's IEEE1394 option, set the VCR Setup Menu item No. 050 REMOTE SELECT to "IEEE1394". ☞ See page 68.

Note:
- When a cable is connected to the VTR REMOTE connector, the VTR Setup Menu is not displayed in the viewfinder. Make settings on the VTR Setup Menu while the cable is not connected.
- When a cable is connected to the VTR REMOTE connector, the VCR operation mode will not be displayed correctly on the Status1 screen in the viewfinder.

■ The S.S.F. data stored in the unit's memory is output from the VTR REMOTE connector.

12. SETUP MENU

12-1 VCR Setup Menu

The setup menus for the VCR section can be set while observing the menu in the viewfinder and on the unit's counter display.
The set contents are stored in the memory and retained even after the power is switched OFF.

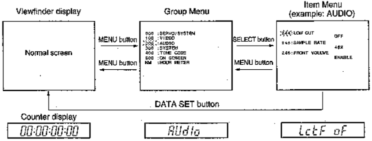
VCR SETUP MENU CONFIGURATION

The VCR Setup Menu is a two-layer construction.
The VCR Setup Menu consists of seven group menus divided according to functions. When a Group menu is selected, the menu's item menu opens. Each item menu contains one or several items, and the various items can be set individually as required.

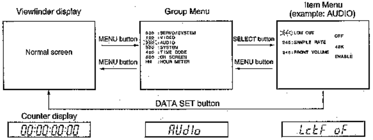
VCR Setup Menu

Group Name		Item Menu Contents
000	SERVO/SYSTEM	Selection of remote control to control the unit Selection of BACK TALLY lamp lighting pattern
100	VIDEO (U-ver. only)	Selection of video input
200	AUDIO	Selection of low cut for audio input signals Selection of sampling frequency for audio input signals Selection of front section audio volume control
300	SYSTEM	Selection of long pause/still duration Selection of battery type Selection of S.S.F. (Super Scene Finder) mode
400	TIME CODE (U-ver. only)	Selection of time code framing mode
500	ON SCREEN	Selection of counter display method (Time code/Date/Time)
HM	HOUR METER	Display of hour meter (accumulated running time of head drum)

U-ver.

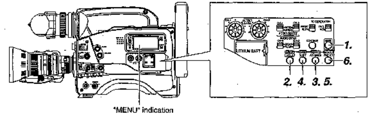

Viewfinder display
Group Menu
Item Menu
(example: AUDIO)
Normal screen
MENU button
MENU button
000 :SERVO/SYSTEM
100 :VIDEO
200 :AUDIO
300 :SYSTEM
400 :TIME CODE
500 :ON SCREEN
HM :HOUR METER
SELECT button
MENU button
244:LOW CUT
OFF
245:SAMPLE RATE
48K
246:FRONT VOLUME
ENABLE
DATA SET button
Counter display
00:00:00:00
AUdIo
LcUt oF

E-ver.

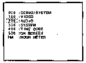

Viewfinder display
Group Menu
Item Menu
(example: AUDIO)
Normal screen
MENU button
MENU button
000 :SERVO/SYSTEM
100 :VIDEO
200 :AUDIO
300 :SYSTEM
400 :TIME CODE
500 :ON SCREEN
HM :HOUR METER
SELECT button
MENU button
244:LOW CUT
OFF
245:SAMPLE RATE
48K
246:FRONT VOLUME
ENABLE
DATA SET button
Counter display
00:00:00:00
AUdIo
LcUt oF

12-1 VCR Setup Menu (Cont'd)

DISPLAYING AND SETTING VCR SETUP MENUS

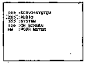


Viewfinder



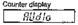
GROUP menu screen for U-ver.

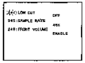
Viewfinder



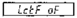
GROUP menu screen for E-ver.

Counter display

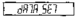




Item menu screen



DATA SET display



1. Engaging the VCR Setup Menu mode.
Press the MENU button.
- The "MENU" indication in the display section starts blinking and the VCR Setup Menu appears in the viewfinder and on the counter display.

> **Note:**
> When a cable is connected to the VTR REMOTE connector, the VTR Setup Menu is not displayed in the viewfinder.

2. Selecting the GROUP.
Press the GROUP button.
- Each time the GROUP button is pressed the selected GROUP number is shown blinking on the viewfinder screen. The counter display shows the selected group.

3. Open the item menu of the selected GROUP.
Press the SELECT button.

4. Selecting the item.
Press the ITEM button.
- Each time the ITEM button is pressed the selected item number is shown blinking on the viewfinder screen. The counter display shows the selected item.

5. Changing the setting value of the item.
Press the SELECT button and select the setting value.
- When multiple items should be set, repeat the operations of steps 4. and 5.
- To set menu items in other groups, press the MENU button. When the relevant group menu is displayed, perform the setting.
- When the GROUP button is pressed, the items of the higher order group menu are displayed.

6. Saving the setting value.
Press the DATA SET button.
- "DATA SET" appears in the viewfinder and on the counter display and the setting value is saved in the GY-DV500's memory. The display returns to the normal screen mode when data has been saved.
- If the MENU button is pressed without pressing the DATA SET button, the display returns to the normal screen mode without the setting value being changed.

12-1 VCR Setup Menu (Cont'd)

VCR SETUP MENU CONTENTS

Group	Item Upper row: Viewfinder display Lower row: Counter display indication	Setting Value	Contents	Factory Setting
SERVO /SYSTEM	050: REMOTE SELECT	LOCAL IEEE1394 RS232C	Selection of the method for remote control of the VCR. LOCAL : Choose this setting when the VCR should be controlled using the operation buttons on the GY-DV500 only. IEEE1394 : Choose this setting when the VCR should be remote controlled from a DV connector equipped video component connected to the DV connector on the rear section of the GY-DV500. RS232C : Choose this setting for control by means of the VCR remote control signal from the VTR REMOTE connector on the GY-DV500. * The operation buttons on the GY-DV500 remain effective even when set to IEEE1394 or RS232C.	LOCAL
	mSL	Lc IE 23		
	082: BACK TALLY MODE	OFF ON BLINK	Selection of the lighting pattern of the BACK TALLY lamp on the rear section during recording. OFF : The lamp is always off. ON : The lamp lights during recording. It remains off until the VTR trigger button is pressed to start the recording. BLINK : The lamp lights during recording. It blinks when the VTR trigger button is pressed to start the recording.	BLINK
	rtMd	oF on bL		
VIDEO (U-ver. only)	126: INPUT SELECT	CAMERA IEEE1394	Selection of the input video signal. Settings cannot be changed during recording. CAMERA : Camera image is input. IEEE1394 : The image from the DV connector equipped video component connected to the DV connector on the rear section is input.	CAMERA
	vid	cA IEEE1394		
AUDIO	244: LOW CUT	OFF CH1 CH2 CH1 & CH2	To select whether or not the low frequencies of the audio signal from the audio input connectors are cut. Set to ON to reduce the wind noise of the microphone. OFF : The CH1 and CH2 low frequencies are not cut. CH1 : Only the low frequencies of the audio signal input to the CH1 channel are cut. CH2 : Only the low frequencies of the audio signal input to the CH2 channel are cut. CH1& CH2 :The low frequencies are cut for both CH1 and CH2.	OFF
	LctF	oF 01 02 on		
	245: SAMPLING RATE	32K 48K	To select the sampling rate for digital PCM audio recording. 32K : Digital recording occurs with 12-bit, 32 kHz sampling 48K : Digital recording occurs with 16-bit 48 kHz sampling. * The DV format offers recording tracks for up to 4 channel when recording using 12-bit, 32 kHz sampling. The GY-DV500 records two of these tracks. The GY-DV500 does not allow after-recording.	48K
	snPL	32 48		
	246: FRONT VOLUME ENABLE	DISABLE ENABLE	To select whether or not the front section recording level control should be operative. The front section recording level control only affects the audio signal recorded on CH1. DISABLE : Use of the front section recording level control is disabled. ENABLE : Use of the front section recording level control is enabled. * The CH-1 recording level control on the side section works regardless of the setting.	ENABLE
	FruL	oF on		

12-1 VCR Setup Menu (Cont'd)

Group	Item Upper row: Viewfinder display Lower row: Counter display Indication	Setting Value	Contents	Factory Setting
SYSTEM	307: LONG PAUSE TIME	3MIN 30MIN	To select the time (minutes) before the save mode (drum head rotation stopped) is engaged when the record-pause, still or stop condition continues. 3MIN : 3 minutes 30MIN : 30 minutes * When used in a cold environment, the setting will be 3 minutes regardless of the setting.	30MIN
	LGPt	03 30		
	396: BATTERY TYPE	12V 13.2V 14.4V	To be set in accordance with the used battery back type. 12V : Choose this setting when using 12V battery (12V DC Flat Shape type). 13.2V : Choose this setting when using 13.2V battery (Anton-Bauer Trimpack 13, Propack 13, Magnum 13, Compack 13). 14.4V : Choose this setting when using 14.4V battery (Anton-Bauer Trimpack 14, Propack 14, Magnum 14, Compack 14). **Note:** • If this setting is neglected, the unit's display of remaining of battery power and generation of battery alarm will not work correctly. • This setting is valid when battery pack is used. It is invalid when a DC power supply is used.	12V
	bAtt	12 13 14		
	398: SSF MODE	OFF CUE MODE MARK MODE	Selection of the S.S.F. (Super Scene Finder) mode. S.S.F. function:While recording, the time code data of a desired recorded scene is stored in the unit's memory when the **TAKE** button on the front section is pressed. Settings cannot be changed during recording. OFF : S.S.F. function is not available. CUE MODE : Selects the CUE mode. When the TAKE button is pressed, the time code data of the scene recorded at that point is stored in the memory. MARK MODE: Selects the MARK mode. When the TAKE button is pressed the first time, the time code of this point is stored as start point of the scene. When the TAKE button is pressed the second time, the time code of this point is stored as ending point of the scene. For details on the S.S.F. function, see page 60. • When the VCR Setup Menu item No. 398 S.S.F. MODE is set to CUE or MARK, the time code generator's running method is internally set to the REGEN mode.	OFF
	SSF	oF cU nr		
TIME CODE (U-ver. only)	416: NON DROP/DROP	DROP NON DROP	Selection of the time code generator's framing mode as either drop or non-drop mode. DROP : The internal time code generator runs in drop mode. Choose this setting when emphasizing the recorded time. NON DROP: The internal time code generator runs in non drop mode. Choose this setting when emphasizing the frame number.	DROP
	tcG	dF nF		
ON SCREEN	516: DISPLAY SELECT	TC CLOCK	Selection of the appearance of the counter display when the COUNTER switch is set to "TC" or "UB". TC : The time code is displayed. CLOCK: The date/time is displayed.	TC
	dSP	tc cL		

12-2 Camera Menu Screen Flow

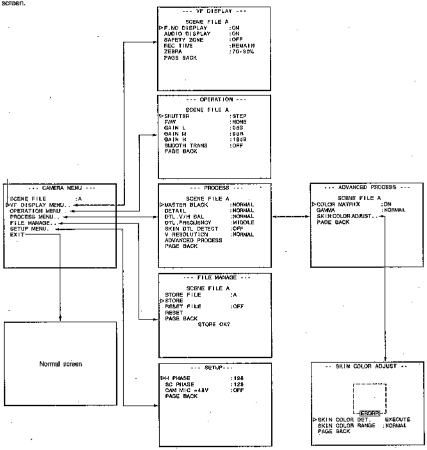
Camera Menu Screen Flow

As illustrated below, the Camera Menu is a menu screen comprising several layers. The first layer of the CAMERA MENU screen is for choosing and setting the menus required in accordance with functions or purposes.

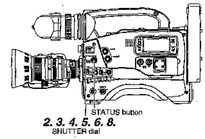
The unit also allows the contents of menu settings to be stored in three files (SCENE FILE A, B, OFF).

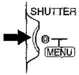
- SCENE FILE A, B .... By performing the FILE STORE operation on the FILE MANAGE screen, the contents of menu settings can be stored and retained in the unit. However, the SET UP menu contents are stored even if the FILE STORE operation is not performed.
  Use SCENE FILE A or B to store and retain the contents of menu settings that remain more or less fixed.
- SCENE FILE OFF .... Whenever you want to change the menu settings, use this SCENE FILE.
  The menu setting contents are stored in the unit even if the FILE STORE operation is not performed.

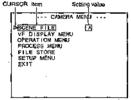
When shooting, select the file with the menu settings to be used from among the three SCENE FILE files on the CAMERA MENU screen.


--- VF DISPLAY ---
SCENE FILE A
▷F.NO DISPLAY :ON
AUDIO DISPLAY :ON
SAFETY ZONE :OFF
REC TIME :REMAIN
ZEBRA :70-90%
PAGE BACK
--- OPERATION ---
SCENE FILE A
▷SHUTTER :STEP
FAW :NONE
GAIN L :0dB
GAIN M :9dB
GAIN H :18dB
SMOOTH TRANS :OFF
PAGE BACK
--- CAMERA MENU ---
SCENE FILE :A
▷VF DISPLAY MENU..
OPERATION MENU ..
PROCESS MENU..
FILE MANAGE..
SETUP MENU.
EXIT
--- PROCESS ---
SCENE FILE A
▷MASTER BLACK :NORMAL
DETAIL :NORMAL
DTL.V/H BAL :NORMAL
DTL.FREQUENCY :MIDDLE
SKIN DTL DETECT :OFF
V RESOLUTION :NORMAL
ADVANCED PROCESS
PAGE BACK
--- ADVANCED PROCESS ---
SCENE FILE A
▷COLOR MATRIX :ON
GAMMA :NORMAL
SKIN COLOR ADJUST..
PAGE BACK
--- FILE MANAGE ---
SCENE FILE A
STORE FILE :A
▷STORE
RESET FILE :OFF
RESET
PAGE BACK
STORE OK?
Normal screen
--- SETUP---
▷H PHASE :128
SC PHASE :128
CAM MIC +48V :OFF
PAGE BACK
-- SKIN COLOR ADJUST --
ERROR
▷SKIN COLOR DET. EXECUTE
SKIN COLOR RANGE :NORMAL
PAGE BACK

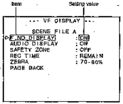
12-3 How to Select from the Camera Menu







CAMERA MENU screen



```
--- VF DISPLAY ---
    SCENE FILE A
F.NO DISPLAY      : ON
AUDIO DISPLAY     : ON
SAFETY ZONE       : OFF
REC TIME          : REMAIN
ZEBRA             : 70-80%
PAGE BACK
```

VF DISPLAY MENU screen

1. Press the STATUS button for 1 second to display the CAMERA MENU screen in the viewfinder.

2. Choose the file with the camera menu settings to be used. (SCENE FILE A, B or OFF)

① Turn the SHUTTER dial up or down to align the cursor with SCENE FILE, and then press the SHUTTER dial in the direction of the arrow.
- The area with the setting value starts blinking, and the value can now be changed.

② Turn the SHUTTER dial up or down to select the setting value. (A, B or OFF)

③ Press the SHUTTER dial in the direction of the arrow.
- The setting value stops blinking but remains lit.

3. Turn the SHUTTER dial up or down to align the cursor with the menu item to be set, and then press the SHUTTER dial in the direction of the arrow.
- The selected menu screen appears in the viewfinder.

4. Choose the menu item from the menu screen.
Turn the SHUTTER dial up or down to align the cursor with the menu item to be set, and then press the SHUTTER dial in the direction of the arrow.
- The area with the setting value starts blinking, and the value can now be changed.

5. Change the setting value.
Turn the SHUTTER dial up or down to change the setting value, and then press the SHUTTER dial in the direction of the arrow.
- The setting value stops blinking but remains lit.
- ■ To change multiple items, repeat steps ***4.*** and ***5.*** above.

6. Return to the CAMERA MENU screen.
Turn the SHUTTER dial up or down to align the cursor with the PAGE BACK item, and then press the SHUTTER dial in the direction of the arrow.
- ■ To change the settings of other menu screens, perform the operations described in steps ***3.*** to ***6.*** above.

7. If SCENE FILE A or B is selected, choose the FILE MANAGE item from the CAMERA MENU screen and perform the operations for storing a file.
☞ See "FILE MANAGE Screen" on page 76.
* It is not necessary to perform the file storage operations for changes made to the SETUP MENU.

8. Complete the CAMERA MENU setting.
Turn the SHUTTER dial up or down to align the cursor with the EXIT item on the CAMERA MENU screen, and then press the SHUTTER dial in the direction of the arrow.
- The normal screen returns in the viewfinder.

12-4 VF Display Screen

Item	Function, Operation	Variation Range	Initial Setting
F NO. DISPLAY	Selects whether or not the F-number of the lens iris is displayed on the Status 1 screen. ON .... F-number is displayed. OFF .... F-number is not displayed.	ON OFF	ON
AUDIO DISPLAY	Selects whether or not the audio indicator is displayed on the Status 1 screen. ON .... Audio indicator is displayed. OFF .... Audio indicator is not displayed.	ON OFF	ON
SAFETY ZONE	Selects the safety zone setting. ☞ See "Safety Zone" on page 29.	OFF ZONE 1 ZONE 2 ZONE 3	OFF
REC TIME	Sets whether the remaining tape recording time or TIME CODE is displayed on the Status 1 screen. TIME CODE .... TIME CODE is displayed. * The time code is displayed even if the VCR Setup Menu item No. 516 DISPLAY SELECT is set to "CLOCK". REMAIN .... Remaining time is displayed.	TIME CODE REMAIN	REMAIN
ZEBRA	Switches the luminance level of the subject sections where the zebra pattern is displayed. 70-80% .... Zebra pattern is displayed in sections with luminance levels between 70% and 80%. 85-95% .... Zebra pattern is displayed in sections with luminance levels between 85% and 90%. OVER 95% .... Zebra pattern is displayed in sections with luminance levels over 95%. OVER 100% .... Zebra pattern is displayed in sections with luminance levels over 100%.	70-80% 85-95% OVER95% OVER100%	70-80%
PAGE BACK	The CAMERA MENU returns when the SHUTTER dial is pressed with the cursor at this position.	–	–

12-5 OPERATION Screen

Item	Function, Operation	Variation Range	Initial Setting
SHUTTER	The SHUTTER button on the right side section is used to select STEP for fixed shutter speed or V.SCAN variable scanning rate for shooting computer monitor screens. STEP .... Enables setting of different fixed shutter speeds. [1/100, 1/250, 1/500, 1/1000, 1/2000] : U-ver. [1/120, 1/250, 1/500, 1/1000, 1/2000] : E-ver. VARIABLE .... Selected when shooting computer monitor screens, etc. [Variable range: 60.1 to 2084.6 Hz, 60.3 to 2084.6 Hz (V. MAX mode)] : U-ver. [Variable range: 50.1 to 2067.8 Hz, 50.3 to 2067.8 Hz (V. MAX mode)] : E-ver.	STEP VARIABLE	STEP
FAW	Selects the W.BAL switch ([illegible] on page 13) position to which the FAW (Full-Time Auto White Balance Adjustment) function is to be assigned. NONE .... FAW function is not used. A .... FAW is assigned to the A position. B .... FAW is assigned to the B position. PRESET .... FAW is assigned to the PRESET position.	NONE A B PRESET	NONE
GAIN L **GAIN M** **GAIN H**	Selects the gain value in each position of the GAIN switch ([illegible] on page 13).	–3dB 0dB 6dB 9dB 12dB 18dB ALC	L: 0dB M: 9dB H: 18dB
SMOOTH TRANS	Smoothens the transition when the GAIN switch ([illegible] on page 13), or WHT.BAL switch ([illegible]) is switched over and achieves gradual change in place of sudden change. However, the smooth transition function does not function when switching the GAIN switch set in ALC, FAS button and the LOLUX button. ON .... Activates the smooth transition function. OFF.................. Deactivates the smooth transition function.	ON OFF	OFF
PAGE BACK	The CAMERA MENU returns when the SHUTTER dial is pressed with the cursor at this position.	–	–

12-6 PROCESS Screen

Item	Function, Operation	Variation Range	Initial Setting
MASTER BLACK	Adjusts the pedestal level (master black), which is the reference of black. • To increase the pedestal level...... Increase the number. (UP) • To decrease the pedestal level .... Decrease the number. (DOWN)	MAX (100) 99 201 gradations to NORMAL (0) to -99 MIN (-100)	NORMAL
DETAIL	Adjusts the detail enhancement level. • To sharpen details .... Increase the number. (UP) • To soften details............................ Decrease the number. (DOWN)	MAX (9) 8 16 gradations to NORMAL (0) to -5 MIN (-6)	NORMAL
DTL. V/H BAL	Sets the direction, horizontal (H) or vertical (V), in which stronger detail enhancement is applied. To strengthen the H enhancement ... ..Increase the number (UP). To strengthen the V enhancement ... ..Decrease the number (DOWN). Note: While the LOLUX function is operating, the setting value is fixed at NORMAL and "FIX" is displayed.	H-MAX (4) 3 8 gradations to NORMAL (0) to -3 H-MIN (-4)	NORMAL
DTL. FREQUENCY	Varies the detail enhancement level by changing the detail enhancement frequency. Set in accordance with the subject HIGH .... Applies strong detail enhancement. Used to shoot subjects with fine patterns. MIDDLE .... Applies medium detail enhancement. LOW .... Applies weak detail enhancement. Used to shoot subjects with large patterns. Note: While the LOLUX function is operating, the setting value is fixed at MIDDLE and "FIX" is displayed.	HIGH MIDDLE LOW	MIDDLE
SKIN DTL DETECT	Sets the Skin Detail function to ON or OFF. ON .... Skin Detail function activated. OFF................ Skin Detail function not activated. ☞ See "Using the Skin Detail Function" on page 84.	ON OFF	OFF
V. RESOLUTION	Increases the vertical resolution. • NORMAL ..... Vertical resolution 380 lines. • V.MAX .... Vertical resolution 450 lines Note: The sensitivity is degraded and the bright sections may be colored depending on the subject.	NORMAL V.MAX	NORMAL
ADVANCED PROCESS	ADVANCED PROCESS Displays the ADVANCED PROCESS Screen. ☞ See "ADVANCED PROCESS Screen" on page 75.		
PAGE BACK	The CAMERA MENU returns when the SHUTTER dial is pressed with the cursor at this position.	–	–

12-7 ADVANCED PROCESS Screen

Item	Function, Operation	Variation Range	Initial Setting
COLOR MATRIX	Sets the color matrix OFF ...... Deactivates the color matrix function ON .... The color reproducibility is enhanced, but noise increases. **CAUTION:** During the LOLUX operation, COLOR MATRIX is fixed to the OFF setting and "FIX" is displayed.	ON OFF	ON
GAMMA	Correction of the gamma curve to decide the reproducibility of black color. • To enhance the black color reproducibility. However, halftones will be lost for white section .... Increase the number • When reproducibility of the black color is not so important .... Decrease the number **CAUTION:** • During LOLUX operation, "FIX" is displayed because GAMMA is fixed at the MIN value.	MAX (8) 7 17 gradations to NORMAL (0) to -7 MIN (-8)	NORMAL
SKIN COLOR ADJUST	Pressing the SHUTTER dial once when the cursor is at this position switches the screen to display the SKIN COLOR ADJUST screen.		
PAGE BACK	The PROCESS MENU returns when the SHUTTER dial is pressed with the cursor at this position.	-	-

12-8 SKIN COLOR ADJUST Screen

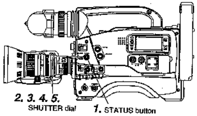
Item	Function, Operation	Variation Range	Initial Setting
SKIN COLOR DETECT	Sets whether it is possible to change the color used by the Skin Detail function. EXECUTE ...... Choose this setting to allow detection of the color used by the Skin Detail function. STOP .... Choose this setting to stop detection of the color used by the Skin Detail function. ☞ See "Using the Skin Detail Function" on page 84.	STOP EXECUTE	STOP
SKIN COLOR RANGE	The setting of this item can only be changed when the SKIN COLOR DETECT item is set to EXECUTE. This setting is for adjusting the skin color range where Skin Detail functions. (When this item is selected, the area where the Skin Detail function is applicable is indicated by zebra patterns on the screen.) While viewing the zebra pattern range, perform the adjustment. Increasing the range .... Increase the number Increasing the range . ... Decrease the number	WIDE +19 (33 gradations) to NORMAL to -11 NARROW	NORMAL
PAGE BACK	The ADVANCED PROCESS MENU returns when the SHUTTER dial is pressed with the cursor at this position.	-	-

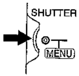
For servicing
See the service manual page 1-17 "1.12 CHANGING THE COLOR MATRIX SETTING".

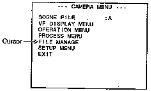
12-9 FILE MANAGE Screen

The unit has three files that can be used for storing camera menus. The FILE MANAGE screen is for performing the operations for saving the set CAMERA MENU.

- When menu settings are made using SCENE FILE A or B, the contents of the settings will be invalid if the storage operations are not performed on this screen. However, the SETUP MENU settings will be valid even if the storage operations are not performed.
- When menu settings are made using SCENE FILE OFF, the contents are stored in the unit at the time settings are changed on each menu screen even if the storage operations are not performed.

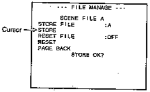






```
--- CAMERA MENU ---
SCENE FILE          :A
VF DISPLAY MENU
OPERATION MENU
PROCESS MENU
▷FILE MANAGE
SETUP MENU
EXIT
```

CAMERA MENU screen



```
--- FILE MANAGE ---
      SCENE FILE A
STORE FILE          :A
▷STORE
RESET FILE          :OFF
RESET
PAGE BACK
         STORE OK?
```

FILE MANAGE screen

Storage Operation

1. Press the STATUS button for about 1 second to display the CAMERA MENU screen.

2. Turn the SHUTTER dial to align the cursor with the FILE MANAGE item, and then press the SHUTTER dial in the direction of the arrow.
- The FILE MANAGE screen appears in the viewfinder.

3. Choose the file to save in (A or B).
① Turn the SHUTTER dial to select the STORE FILE item, and then press the SHUTTER dial in the direction of the arrow.
② Turn the SHUTTER dial to select the file to save in (A or B), and then press the SHUTTER dial in the direction of the arrow.

4. Save the menu settings.
Turn the SHUTTER dial to align the cursor with the STORE item, and then press the SHUTTER dial in the direction of the arrow.
- The "STORE OK?" message appears in the lower section of the centre of the screen.

When the SHUTTER dial is pressed in the direction of the arrow once more, the menu settings are stored in the selected STORE FILE.

5. Close the FILE MANAGE screen
Turn the SHUTTER dial to align the cursor with PAGE BACK, and then press the SHUTTER dial in the direction of the arrow.
- The CAMERA MENU screen returns in the viewfinder.

Memo:
- When changing the menu settings in SCENE FILE A and saving in STORE FILE B:
  SCENE FILE B: The contents become the menu contents of the changed settings.
  SCENE FILE A: The contents become the menu contents valid before the settings were changed.
- When changing the menu settings in SCENE FILE OFF and saving in STORE FILE B:
  SCENE FILE B: The contents become the menu contents of the changed settings.
  SCENE FILE OFF: The contents become the menu contents of the changed settings.

■ Resetting the menu settings to the initial settings is also done using the FILE MANAGE screen.

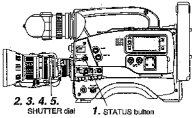
☞ See "Resetting the Camera Menu Settings" on page 78.

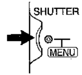
12-10 SETUP Screen

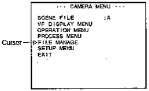
Item	Function, Operation	Variation Range	Initial Setting
H PHASE	For adjusting the horizontal phase of the unit in relation to the signal (external sync signal) input through the SYNC IN connector on the left side of the unit. Delaying the horizontal phase of the unit in relation to the external sync signal. .... Increase the number Speeding up the horizontal phase of the unit in relation to the external sync signal. .... Decrease the number * Adjustment is not possible if the external sync signal is not input. Possible values are indicated by "**".	0 to 256	128
SC PHASE	For adjusting the sub-carrier (SC) of the unit in relation to the signal (external sync signal) input through the SYNC IN connector on the left side of the unit. Rotating the sub-carrier clockwise in relation to the external sync signal .... Increase the number Rotating the sub-carrier anticlockwise in relation to the external sync signal .... Decrease the number * Adjustment is not possible if the external sync signal is not input. Possible values are indicated by "**". The phase will change when the power is turned on/off. The SC phase must be adjusted each time the power is turned on.	0 to 256	128
CAM MIC +48V	To set whether or not 48V voltage should be applied to the MIC IN connector on the front section. ON .... 48V applied. OFF .... 48V not applied.	ON OFF	ON
PAGE BACK	The CAMERA MENU returns when the SHUTTER dial is pressed with the cursor at this position.	–	–

12-11 Resetting of Camera Menu Setting Values

Using the **FILE MANAGE** screen, the CAMERA MENU settings can be reset to the initial setting values. On the FILE MANAGE screen, select the file of the CAMERA MENU to be reset, and then perform the resetting operation.

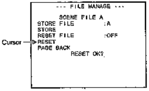






```
--- CAMERA MENU ---
SCENE FILE          :A
VF DISPLAY MENU
OPERATION MENU
PROCESS MENU
FILE MANAGE
SETUP MENU
EXIT
```

CAMERA MENU screen



```
--- FILE MANAGE ---
      SCENE FILE A
STORE FILE          :A
STORE
RESET FILE          :OFF
RESET
PAGE BACK
         RESET OK?
```

FILE MANAGE screen

Reset Operation

1. Press the STATUS button for about 1 second to display the CAMERA MENU screen.

2. Turn the SHUTTER dial to align the cursor with the FILE MANAGE item, and then press the SHUTTER dial in the direction of the arrow.
- The FILE MANAGE screen appears in the viewfinder.

3. Choose the file of the CAMERA MENU to be reset (A, B, OFF or ALL)
- If ALL is selected, all the CAMERA MENU files will be reset.

① Turn the SHUTTER dial to align the cursor with the RESET FILE item, and then press the SHUTTER dial in the direction of the arrow.

② Turn the SHUTTER dial to select the file to be reset, and then press the SHUTTER dial in the direction of the arrow.

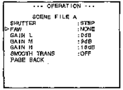
4. Reset the camera menu settings.
Turn the SHUTTER dial to align the cursor with the RESET item, and then press the SHUTTER dial in the direction of the arrow.
- The "RESET OK?" message message appears in the lower section of the centre of the screen.

When the SHUTTER dial is pressed in the direction of the arrow once more, the CAMERA MENU settings of the selected file are reset to the initial settings.

5. Close the FILE MANAGE screen
Turn the SHUTTER dial to align the cursor with PAGE BACK, and then press the SHUTTER dial in the direction of the arrow.
- The CAMERA MENU screen returns in the viewfinder.

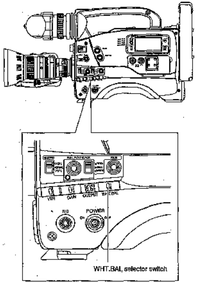
13. FEATURES OF THE CAMERA SECTION

13-1 Full-Time Auto White Balance (FAW)



```
    ··· OPERATION ···

      SCENE FILE A
 SHUTTER              :STEP
▷FAW                  :NONE
 GAIN L               :0dB
 GAIN M               :9dB
 GAIN H               :18dB
 SMOOTH TRANS         :OFF
 PAGE BACK
```



WHT.BAL selector switch

The FAW function adjusts the white balance value automatically as the lighting condition changes.

This mode is convenient when you have no time to adjust the white balance or when the camera is moved frequently in and out of places under different lighting conditions.

Setting procedure

The FAW function can be activated with item "FAW" on the OPERATION Menu.

This item allows allocation of the FAW function to the A, B or PRST position of the WHT.BAL selector switch.

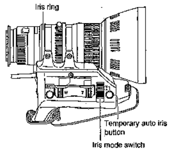
☞ See "OPERATION Screen" on page 73.

CAUTION:

The FAW (Full-time Auto White balance) function cannot provide optimum white balance with a subject outside the FAW adjustment range, for example when it contains only a single color or not enough white color.

13-2 IRIS (Brightness) Adjustment

ADJUSTMENT OF LENS IRIS



The lens iris can be adjusted using any of the following three methods.

- **Automatic adjustment**
  Set the iris mode switch to "A" (Auto).
  The iris is adjusted automatically according to the brightness of the object.
- **Manual adjustment**
  Set the iris mode switch to "M" (Manual).
  The iris can be adjusted manually by rotating the iris ring.
- **Temporary auto iris adjustment**
  During manual iris adjustment, the auto iris adjustment mode is activated only while this button is held depressed.

■ Changing the auto iris adjustment setup

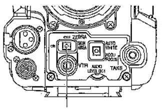
Under special lighting conditions such as backlight, it is often appropriate to change the value set by the auto iris adjustment.

This can be done by the following methods.

- Setting the AUTO IRIS LEVEL switch of the camera

☞ See "SWITCH FUNCTIONS" on page 83.

ZEBRA PATTERN DISPLAY DURING MANUAL ADJUSTMENT



By setting the ZEBRA switch to **ON**, oblique stripes (zebra pattern) can be displayed in the sections with a luminance level of 70% to 80% or sections with levels over 100% in the viewfinder.

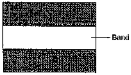
The zebra pattern can be used as a reference for manual iris adjustment.

When adjusting the iris manually, adjust it so that the zebra patterns are displayed in the section that you want to stress in the subject.

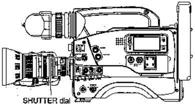
- The initial setting is 70 to 80%. However, using the "ZEBRA" setting on the VF DISPLAY MENU, zebra patterns can be displayed in the sections with a luminance level of 85 to 95%, over 95% and over 100%.

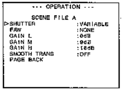
☞ See "VF DISPLAY MENU Screen" on page 72.

13-3 Shooting the Screen Image on a Computer Monitor



Video monitor





```
--- OPERATION ---

      SCENE FILE A
▷SHUTTER            :VARIABLE
 FAW                :NONE
 GAIN L             :0dB
 GAIN M             :9dB
 GAIN H             :18dB
 SMOOTH TRANS       :OFF
 PAGE BACK
```

OPERATION MENU screen

■ Outline

The following operation allows the alignment of the shutter speed of the camera with the variable scanning rate of a computer monitor or display.

When a computer monitor screen or display is shot with the camera, a bright horizontal line indicating excessive exposure is displayed in cases when the scanning rate of the monitor is faster than the shutter speed of the camera. A dark horizontal line indicating insufficient exposure is displayed in cases when the monitor's scanning rate is slower than the camera's shutter speed.

The scanning frequency of a monitor varies due to various reasons during the computer operation. Adjust the scanning rate to obtain a stable image while observing the image in the viewfinder.

■ Variable Scan [V.SCAN]

- **Basic operation**
  Set the SHUTTER item on the OPERATION MENU screen to VARIABLE. Then move the SHUTTER knob upwards or downwards to change the shutter speed.
  (The speed is displayed on the viewfinder screen.)
- **Compatible frequencies**
  The variable scan function is compatible with scanning frequencies in the following range.
  60.1 to 2084.6 Hz (U-ver.)
  50.1 to 2067.8 Hz (E-ver.)

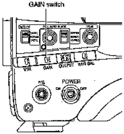
CAUTION:

This function is not compatible with slow-speed computer monitors with a vertical scanning speed of 60 Hz (U-ver.)/ 50 Hz (E-ver.).

13-4 Gain (Sensitivity) Adjustment

The gain should be switched when the brightness is insufficient due to poor lighting conditions.

GAIN SWITCHING



CAUTION:

When gain is set to "ALC", gain is boosted automatically as the illumination becomes darker. However, noise will increase a little because the screen becomes brighter as the ALC (Auto Level Control) function boosts the gain more than in the case of manual adjustment.

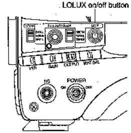
This switch allows the gain to be boosted when the illumination of the subject is insufficient.

Switch Position	Factory-Set Gain
L	0dB
M	9dB
H	18dB

When the GAIN switch is switched, the newly set gain is displayed for about 2 seconds on the Status 0 or Status 1 screen in the viewfinder.
Set it to L (0 dB) in normal use.

- The gain set for each of the switch positions can be changed with "GAIN" on the OPERATION MENU screen.
- It is also possible to use the ALC function that varies the gain automatically.
  ☞ See page 73 for details.
- To make the gain transition smoother, set "SMOOTH TRANS" on the OPERATION MENU to "ON".
  ☞ See page 73.
  However, note that the SMOOTH TRANS function is not available if gain is set to ALC.

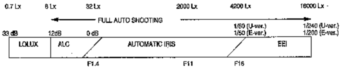
GAIN BOOST UNDER LOLUX CONDITION



The LOLUX button is used when the illumination is still insufficient after compensating with the GAIN switch.
Press the button to enter the LOLUX mode in which the gain is boosted by about 33 dB.
"LOLUX ON" is displayed for about 2 seconds on the Status 0 or Status 1 mode screen in the viewfinder.
Pressing the button again cancels the LOLUX mode.
"LOLUX OFF" is displayed for about 2 seconds.

- When the LOLUX function is in use, the image definition on the screen will degrade to increase residual images, but this is not a malfunction.

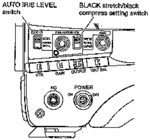
[Relationship between gain, iris and shutter]



13-5 Switch Setup According to Illumination and Subject

Various switch settings are performed to accommodate the conditions of the illumination and the subject when shooting.

SWITCH FUNCTIONS



①**AUTO IRIS LEVEL switch**

This switch allows the reference value for the auto iris adjustment to be changed according to the lighting condition.

BACK. L : When the subject is in backlit conditions. Sets the Auto Iris reference value to a value that is about 1 step wider than the standard setting.

NORMAL: Normal lighting condition.

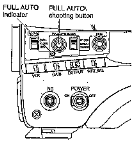
SPOT. L : When the subject is under a spotlight. Sets the Auto Iris reference value to a value that is about 1 step narrower than the standard setting.

②**BLACK stretch/black compress switch**

This switch makes the image easier to see by varying the black gain.

BLACK STRETCH	: Boosts the gain of black areas to improve the reproducibility of black.
NORMAL	: Normal black gain.
BLACK COMPRESS	: Attenuates the gain of black areas to make the image sharper.

FULL AUTO SHOOTING (FAS) FUNCTION



The FAS function provides a wide range of compatibility with shooting conditions that varies as you move between indoors and outdoors or between bright and dark locations. It eliminates the need to change the switch and filter positions every time you move.

The FAS function provides an integrated control of the ALC (Automatic Level Control), Auto iris and FAW (Full-time Auto White balance) functions.

Operation

1. Simply press the FULL AUTO button to enter the FAS mode, in which the FULL AUTO indicator lights and "FAS" is displayed to the right in the viewfinder.
2. Pressing the FULL AUTO button again cancels the FAS mode and turns the FULL AUTO indicator off.

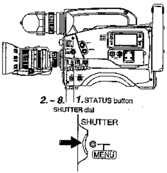
■ Automatic Setting Contents

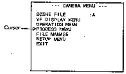
- If you have been displaying the color bars, the screen is switched automatically to the camera image.
- The auto iris adjustment mode is entered even if the iris mode switch of the lens is set to manual.
- The GAIN switch and WHT.BAL switch settings are defeated in the FAS mode.
- The LOLUX button setting is active even in the FAS mode. However, the ALC and EEI are defeated in the LOLUX mode, in which only the auto iris adjustment and FAW are used.
- All of the previous setting contents are recalled when the FAS mode is cancelled.
- The SMOOTH TRANS function is defeated during switch to the FAS function.

CAUTION:
- When the power is turned on while the camera is in the FAS mode, it takes about 10 seconds before the automatic adjustment of FAS is completed.
- In the FAS mode, the audio recording level is not set automatically to the AUTO mode. To select the AUTO mode, set the AUTO/MANUAL switch of the VCR section to AUTO.

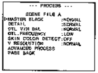
13-6 How to Use Skin Detail

The contour emphasis in the skin color areas of the video signal can be controlled and made to appear gentle and smooth.



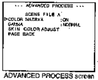


```
--- CAMERA MENU ---
  SCENE FILE          :A
  VF DISPLAY MENU
  OPERATION MENU
>PROCESS MENU
  FILE MANAGE
  SETUP MENU
  EXIT
```



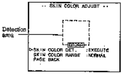
```
--- PROCESS ---
      SCENE FILE A
>MASTER BLACK        :NORMAL
 DETAIL              :NORMAL
 DTL V/H BAL         :NORMAL
 DTL.FREQUENCY       :LOW
 SKIN COLOR DETECT   :OFF
 V RESOLUTION        :NORMAL
 ADVANCED PROCESS
 PAGE BACK
```

PROCESS screen



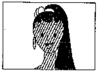
```
--- ADVANCED PROCESS ---
      SCENE FILE A
>COLOR MATRIX        :ON
 GAMMA               :NORMAL
 SKIN COLOR ADJUST
 PAGE BACK
```

ADVANCED PROCESS screen



```
-- SKIN COLOR ADJUST --
>SKIN COLOR DET.     :EXECUTE
 SKIN COLOR RANGE    :NORMAL
 PAGE BACK
```

SKIN COLOR ADJUST screen

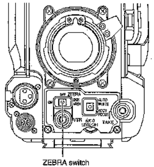


SKIN COLOR ADJUST screen

■ Setting the Color and Range of the Skin Detail Function

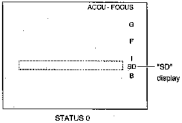
1. Press the STATUS button for about 1 second to display the CAMERA MENU screen.
2. Turn the SHUTTER dial downward to align the cursor (>) with the PROCESS item. Then press the SHUTTER dial in the direction of the arrow to display the PROCESS screen.
3. Turn the SHUTTER dial downward to align the cursor (>) with the ADVANCED PROCESS item. Then press the SHUTTER dial in the direction of the arrow to display the ADVANCED PROCESS screen.
4. Turn the SHUTTER dial downward to align the cursor (>) with the SKIN COLOR ADJUST item. Then press the SHUTTER dial in the direction of the arrow to display the SKIN COLOR ADJUST screen.
   - The frame shown on the screen indicates the detection area of the skin detail function.
5. When the cursor (>) is aligned with the SKIN COLOR DET. item, the SHUTTER dial is pressed in the direction of the arrow and EXECUTE selected, the skin color detection mode is activated.
6. Shoot so that the area with the color that you want to detect is brought within the detection area frame. To decide on the color for the detection, press the SHUTTER dial to set SKIN COLOR DET. to STOP.
   - The areas recognized by the skin detail function appear with superimposed zebra patterns.
   - If the color is not recognized as a color that the skin detail function works with, "ERROR" is displayed on the screen.
7. If you want to change the color range recognized by the skin detail function, perform the following operations.
   Set the SKIN COLOR DET. item to EXECUTE.
   ① Turn the SHUTTER dial to align the cursor (>) with SKIN COLOR RANGE, and then press the SHUTTER dial in the direction of the arrow.
      ➜ The area with the setting value starts blinking, and the value can now be changed.
   ② Turn the SHUTTER dial up or down to widen or narrow the color range.
      - Adjust the range while observing the zebra patterns.
   ③ To decide the color range, press the SHUTTER dial in the direction of the arrow.
      ➜ The setting value stops blinking but remains lit.
8. To stop the SKIN COLOR ADJUST operation, align the cursor (>) with BACK PAGE and press the SHUTTER dial in the direction of the arrow.

13-6 How to Use Skin Detail (Cont'd)



■ Confirming the color tone area adjusted with the Skin Detail function

When the ZEBRA switch on the front section is pressed to the "SKIN AREA" side, the color tone areas adjusted with Skin Detail are displayed in the viewfinder.



■ Using the Skin Detail Function

To use the skin detail function set on the SKIN COLOR ADJUST screen, set the SKIN DTL DETECT item on the PROCESS menu to "ON".

While the Skin Detail function operates, the "SD" indicator is displayed on the Status 0 and Status 1 screen in the viewfinder.

For servicing
See the service manual page 2-7 "2.4.3 Cleaning".

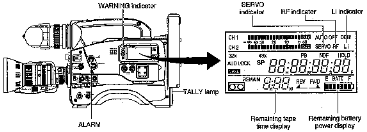
14. OTHERS

14-1 Troubleshooting

Warnings concerning problems with the unit are provide in the form of indicators, display indications and monitor tones.
The warnings are of the following two types.

- Alarm indications : These indications are given to provide warning on the status of the unit, for example when the tape or battery pack should be replaced.
- Error code display : In case an error occurs during operation, the unit self-diagnoses the cause and shows the diagnostics results on the counter display. When this happens, the unit stops operation automatically or ejects the videocassette.

ALARM INDICATIONS



When an alarm is indicated, the unit operates in the following ways.

Alarm Indicator on VCR Display	Symptom	VCR Operation and Remedy
DEW	Indicates dew formation (condensation).	Operation : The VTR rejects operation. Remedy : Leave the power on, and wait until the indication disappears.
SERVO (Counter display) "SYnc Inh"	Lights in the case of troubles with the drum servo during recording. Lights when the input sync signal is disturbed or the unit is subjected to physical shock. (Displayed only in record mode)	Operation : During recording the mode becomes the stop mode. During playback, playback of the disturbed video image continues. Remedy : • Also check the input sync signal. • Signal is disturbed when the unit is subject to a violent shock. In other cases, please consult the person in charge of professional video equipment at your nearest JVC-authorized service agent.
RF (Counter display) "HEAd CLoG"	Lights in case of video head clogging. (Head clogging is detected and indicated during playback and recording check using the RET button on the lens section.)	Operation : Continues. Remedy : Clean the head with the special head cleaning tape. (See page 7 and the separate sheet "Precautions for Use of Head Cleaning Tape".)
(Counter display) Pc TAPE	Improper cassette type	Operation : Operation stops. Remedy : Use recordable MiniDV cassette for recording video and audio.
Li	Lights when the lithium battery for backup of time code generator and date/time data is exhausted.	Operation : Continues. Remedy : Replace with a new lithium battery. See page 34.
Remaining tape time REMAIN 0:02	* About 2 minutes before tape end. (The TALLY lamp and alarm sound are activated only in the record mode.)	Operation : Continues.
	* When the tape has ended completely.	Operation : Stops.
Remaining battery power E BATT	When the remaining battery capacity is low.	Operation : Continues. Remedy : Replace battery pack early.
E BATT	When the battery capacity drops to an insufficient level.	Operation : Stops automatically. The camera may generate abnormal signals. This is not a malfunction.

14-1 Troubleshooting (Cont'd)

Alarm Indications (Cont'd)

Depending on the alarm conditions, the warning indicators in the LCD display, the WARNING indicator, the TALLY lamp, alarm tones and the viewfinder appear as shown in the following table.

Alarm Indications				Viewfinder		
LCD Display	WARNING Indicator	TALLY Lamp	Alarm Tone	WARNING Lamp		On Screen Display
				REC Lamp	BATT. Lamp	
"DEW" Indicator	✾	✾	‖‖‖‖	✾	—	VTR WARNING (DEW)
"SERVO" indicator "SYnc inh" indicator	✾	✾	‖‖‖‖	✾	—	VTR WARNING (SERVO)
"RF" Indicator "HEAd CLoG" Indicator	✾	✾	‖‖‖‖ (Only during the interval from when the VTR trigger button is pressed and until recording starts.)	✾	—	VTR WARNING (HEAD)
"U" indicator	—	—	—	—	—	—
Remaining tape time	◑	◑ (In record mode only)	—‖—	◑	—	TAPE NEAR END About 2 min. before tape end.
	●	✾	▓	✾	—	TAPE END
Remaining battery power E BATT	◑	◑ (Except for play /search mode)	—‖—	◑	●	LOW BATTERY
E BATT	●	✾	▓	✾	●	LOW BATTERY

The WARNING indicator normally lights green or orange to indicate that operation is possible.

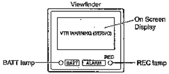
The color changes to red to indicate an alarm and appears as described above.

The alarm tone output is superimposed on the audio signal output from the monitoring loudspeaker or EARPHONE jack.

The volume of the alarm tone can be adjusted with the ALARM volume control.

Display symbols

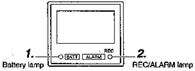
● : Steady lighting. ◑ : Blinking once per second. ✾ : Blinking 4 times per second.
▓ : Continuous sound. —‖— : Sound interrupted once per second. ‖‖‖‖ : Sound interrupted 4 times per second.



14-1 Troubleshooting (Cont'd)

WARNINGS IN VIEWFINDER

Viewfinder Warning Lamps



1. BATTERY lamp
This red lamp lights under the following circumstance.
Lights red : • When the battery voltage becomes too low for the camera to operate.

2. REC/ALARM lamp
This lamp **lights** or **blinks green** under the following conditions.
Lights Green : • While recording
Blinks Green : • During the interval where the unit switches from record-pause to record mode.
• Immediately before the tape runs out or has run out.
• If the unit malfunctions.

■ **Character display warnings:**

LOW BATTERY : This blinks when the battery level becomes too low.
TAPE NEAR END: Less than 3 minutes tape remaining.
TAPE END : The tape has run out.

■ **Function Failures**

When an abnormality occurs in the unit or an improper operation is performed, one of the following warning messages will appear in the viewfinder.

- **VTR WARNING (HEAD):**
  Lights in case of video head clogging.
  (Head clogging is detected and indicated during playback and recording check using the RET button on the lens section.)
- **VTR WARNING (SERVO):**
  Lights in the case of drum servo trouble during recording.
- **VTR WARNING (DEW):**
  Lights when condensation occurs in the unit.
- **VTR WARNING (STOP):**
  Lights in case the unit stops operating.
- **VTR WARNING (HARD):**
  Lights when abnormality occurs in the unit.
- **VTR WARNING (REW):**
  Lights when abnormality occurs with tape rewind operation.
- **CLOSE CASSETTE COVER:**
  Lights when the cassette cover has not been closed.
- **REC INHIBIT:**
  Indicated when an unrecordable videocassette (the switch on the back of the cassette is set to SAVE) is loaded.
- **NO TAPE:**
  Lights when the VTR trigger button is pressed with no videocassette loaded.

VTR WARNING(HEAD)

Status 0 or
Status 1 mode

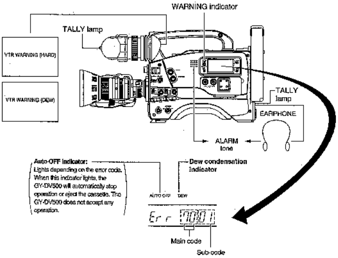
■ **Warnings on the White Balance Function**

- **AUTO WHITE A, B NG: OBJECT** — Improper object.
  - Check whether the object being shot is white enough.
  - Check that selected filter suits the illumination conditions.
- **AUTO WHITE A, B ERROR: LOW LIGHT** — Amount of incident light insufficient.
  - Check to see if it is necessary to increase illumination or perform iris adjustment.
- **AUTO WHITE A, B ERROR: OVER LIGHT** — Amount of incident light excessive.
  - Check to see if illumination and iris adjustment are appropriate.

AUTO WHITE A
NG:OBJECT

14-1 Troubleshooting (Cont'd)

In the case of troubles occurring during operation of the GY-DV500, it performs a self-test to identify the cause and displays the result in the form of an error code. The error code consists of the "main code" which indicates its contents and the "sub-code" which indicates the details. Depending on the status of the GY-DV500 at this time, indications may also appear on the LCD display, the WARNING indicator may activate and the alarm tone may be generated.
In the viewfinder, the "VTR WARNING (DEW)" indication appears when condensation is detected, and the "VTR WARNING (STOP)", "VTR WARNING (HARD)" or "VTR WARNING (REW)" indication appears depending on the contents of the error code when some of the other error codes are displayed.


WARNING indicator
TALLY lamp
VTR WARNING (HARD)
VTR WARNING (DEW)
TALLY lamp
EARPHONE
ALARM tone
Auto-OFF indicator:
Lights depending on the error code. When this indicator lights, the GY-DV500 will automatically stop operation or eject the cassette. The GY-DV500 does not accept any operation.
Dew condensation indicator
AUTO OFF
DEW
Err 7001
Main code
Sub-code

WARNING Indicator	Alarm Tone	Display	GY-DV500 Operation
Red, blinking	Continuous	"Error code"	• Automatically ejects the cassette. It can be inserted again.
		"Error code" plus "AUTO OFF"	• Automatically stops operation or ejects the cassette. (Auto OFF) * The GY-DV500 does not accept any operation.
Red, blinking	Intermittent	"DEW"	• Dew condensation inside the unit. The GY-DV500 does not accept any operation until the DEW indicator disappears from the display.

* In the Auto OFF status, it is impossible to operate the GY-DV500. This condition can be cancelled by switching the POWER switch OFF and then switching it ON again. If the same problem occurs again after the power is turned ON, there may be something wrong with the GY-DV500. Please consult the person in charge of professional video equipment at your nearest JVC-authorized service agent.

The GY-DV500 is a microcomputer-controlled piece of equipment, which may malfunction due to external noise or interference. In this case, set the POWER switch to OFF, remove the lithium backup battery, and then set the POWER switch to ON again after a few minutes.

For servicing
See the service manual page 1-22 "1.16 WARNING CODES".

14-1 Troubleshooting (Cont'd)

TROUBLES WITH ERROR CODE OUTPUTS

Error Code	Error Details	GY-DV500 Operation	Remedy
3200	Tape loading impossible.	Operation stops. All operations are rejected.	Switch the power OFF and then switch it back ON. However, the tape may be damaged depending on the situation. Please consult the person in charge of professional video equipment at your nearest JVC-authorized service agent.
3300	Tape unloading impossible.	Operation stops. All operations are rejected.	
4000	Irregular cassette intake operation.	Operation stops. All operations are rejected.	
4100	Irregular eject operation.	Operation stops. All operations are rejected.	
4200	Cassette housing abnormality.	Operation stops. All operations are rejected.	
5605	Tape is cut.	Operation stops. All operations are rejected.	Open the cassette cover by using the EJECT switch and then switch the power ON again.
5606 to 5607	Tape is slack.	Operation stops. All operations are rejected.	Switch the power OFF and then switch it back ON. However, the tape may be damaged depending on the situation. Please consult the person in charge of professional video equipment at your nearest JVC-authorized service agent.
5702	Tape end sensor error.	Operation stops. All operations are rejected.	
5802	Tape beginning sensor error.	Operation stops. All operations are rejected.	
7001	Drum rotation stopped.	Operation stops. All operations are rejected.	Switch the power OFF and then switch it back ON. However, the tape may be damaged depending on the situation. Please consult the person in charge of professional video equipment at your nearest JVC-authorized service agent.
7101	Capstan rotation stopped.	Operation stops. All operations are rejected.	
7202 to 7203	Supply reel rotation error.	Operation stops. All operations are rejected.	
7302 to 7303	Take up reel rotation error.	Operation stops. All operations are rejected.	
7305	Irregular tape winding when unloading.	Operation stops. All operations are rejected.	

14-1 Troubleshooting (Cont'd)

TROUBLES WITHOUT ERROR CODE OUTPUTS

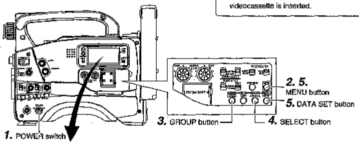
Symptoms	Remedy
Power cannot be switched ON.	• Is power supply connected properly? • Is battery pack recharged? • When the lithium battery is depleted, it may not be possible to turn on the power. • Was the power turned ON immediately after being turned OFF? Wait at least 5 seconds before turning the power ON again once it has been turned OFF.
Operation buttons on the GY-DV500 don't work.	• Is the cassette cover open? The GY-DV500 remains inoperative as long as the cassette door is open.
Recording is not possible.	• Is switch on cassette set to REC? If it is set to SAVE, set it to REC. • When not connected via the DV connector, is the VCR Setup Menu item No. 126 INPUT SELECT set to "IEEE1394"? If so, set to "CAMERA".
Even if the image appears in the viewfinder, the signal is not output to the MONITOR OUT or YC OUT connectors. (U-ver. only)	• When not connected via the DV connector, is the VCR Setup Menu item No. 126 INPUT SELECT set to "IEEE1394"? If so, set to "CAMERA".
Noise interferes with playback video.	• Video head may be clogged with dirt. Clean head with the special head cleaning tape. (See page 7 and the separate sheet "Precautions for Use of Head Cleaning Tape".)
Sound and picture are disturbed during playback.	• Is the sync signal input to the SYNC IN connector disturbed? If so, check and remedy the input sync signal.
Time code data is not shown as on-screen-display.	• Time code data is not shown as on-screen-display during recording or playback. The data is shown only on the counter display.
Time code and user's bit data are not shown on the counter display.	• Is the COUNTER switch set to "CTL"? If so, set the switch to "TC" or "UB".
Remaining battery power display is incorrect.	• The VCR Setup Menu item No. 396 BATTERY TYPE may not be set correctly in accordance with the type of battery in use. If the menu item setting is incorrect, set it correctly using the VCR setup menu item BATTERY TYPE. • Is the battery old?
Battery alarm is displayed and the GY-DV500 enters the non-operating mode even when a fully charged battery is used.	
Cassette cannot be ejected after the power is turned ON.	• The capacity of the power supply may be insufficient. Check the power voltage.
Viewfinder image looks dark or unclear.	• Adjust the viewfinder's contrast and bright controls. • Is the filter turret set to 5600K+ND? • Is the iris closed? • Is the shutter speed too fast? • Is the viewfinder cable correctly connected?
Noise appears when playing back a tape recorded on another unit.	• When a tape recorded on another unit is played back or used for recording, this phenomenon may occur due to tracking errors.
The transient section between scenes recorded on other units and those recorded on this unit may appear disturbed.	
The front section's recording level control doesn't work.	• Is the VCR Setup Menu item No. 246 FRONT VOLUME ENABLE set to "DISABLE". If so, set to "ENABLE".
The front section's recording level control doesn't change the recording level of the sound input to CH2.	• The front section's recording level control cannot be used to change the recording level of the sound input to CH2. Use the side section's CH2 recording level control for this purpose.
Recording operation stopped.	• Is the SERVO indicator or "SYNC INH" displayed on the counter display? If so, check the input sync signal.

For servicing
See the service manual page 2-7 "2.4.3 Cleaning".

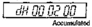
14-2 Hour Meter Display

The unit can display the accumulated running time of the head drum as hour meter data on the counter display. The hour meter can be displayed by selecting HM (HOUR METER) on the VCR Setup Menu. Use this as a guide for periodical maintenance.
☞ See page 7.

Note:
The hour meter is not shown correctly when no videocassette is inserted.

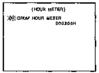


Counter display



Accumulated drum running time: 200 hrs.

Viewfinder



1. Set the POWER switch to ON.

2. Press the MENU button to display the VCR Setup Menu. "MENU" lights in the display, and the VCR Setup Menu's group menu appears in the viewfinder and on the counter display.

3. Press the GROUP button and choose "HM: HOUR METER".
   - "HM HOUR METER" is shown blinking in the viewfinder. The counter display shows "Hour".

4. Press the SELECT button.
   The accumulated running time of the head drum is indicated in the viewfinder and on the counter display.

5. To return to the normal mode, press the DATA SET button.
   - Pressing the MENU button returns you to the group menu.

14-3 Specifications

■ **CAMERA SECTION**

Image pickup devices: 1/2-inch interline CCD x 3

Color separation optical system:
F1.4 3-color separation prism

Number of effective pixels:
380,000 pixels ((H) 768 x (V) 494) : U-ver.
440,000 pixels ((H) 752 x (V) 582) : E-ver.

Color system : NTSC (R-Y, B-Y encoder)
PAL (R-Y, B-Y encoder)

Color bars : SMPTE color bar : U-Ver.
EBU color bar : E-Ver.

Sync system : Internal sync (built-in SSG)
External sync (VBS or BB)

Lens mount : Bayonet system
(compatible with 1/2-inch lenses)

Optical filter : 3200 K, 5600 K, 5600 K + ND (1/64)

Sensitivity : F11, 2000 lx

Minimum illumination: 0.75 lx (F1.4, LOLUX mode)

Gain : -3, 0, 6, 9, 12, 18 dB, ALC, LOLUX,

Shutter speed : 1/100, 1/250, 1/500, 1/1000, 1/2000 : U-ver.
1/120, 1/250, 1/500, 1/1000, 1/2000 : E-ver.

V.SCAN speed : 60.1 Hz to 2084.6 Hz : U-ver.
50.1 Hz to 2067.8 Hz : E-ver.

Registration : 0.05% or less (excluding lens distortion)

Contour correction : Horizontal: dual-edged. Vertical: 2 H

■ **VCR SECTION**

Format : Mini DV (SP mode only)

Tape speed : 18.812 mm/s : U-ver.
18.831 mm/s : E-ver.

Record/Play time : 60 minutes
(With M-DV60ME cassette)

F.F/Rewind time : Approx. 3 minutes 30 seconds
(With M-DV60ME cassette)

[VIDEO]

Recording format : 8-bit, 13.5 MHz, 4:1:1 component recording : U-ver.
8-bit, 13.5 MHz, 4:2:0 component recording : E-ver.

[AUDIO]

Recording format : 16-bit, 48 kHz, 2-channel PCM audio/12-bit, 32 kHz 2-channel PCM audio

Frequency response : 20 Hz to 20 kHz (48 kHz mode)

Wow & flutter : Below measurable limit

[Time Code System]

Time code signal : Compliance with SMPTE standard : U-ver.
Compliance with EBU standard : E-ver.

■ **INPUT/OUTPUT SIGNALS**

Video signal output : 1 V (p-p), 75 ohms (BNC)
unbalanced composite output.

YC output : Y 1 V (p-p) 75 ohms unbalance
C 0.286 V (p-p) for U-ver. or 0.3 V (p-p) for E-ver. 75 ohms unbalance (4-pin)

Lens : 12-pin connector

Audio Input : Microphone -60dBs, 3 kohm balanced (XLR-3)
Line +4dBs, 10 kohm balanced (XLR-3)

Audio output : -6 dBs, low impedance, unbalanced

Earphone output : -60 dBs to -17 dBs, at 8-ohm load
(Monaural mini jack)

DC input : 12V DC (11 to 15 V DC) (XLR-4)

Auxiliary power output: 12 V DC, max. 0.1A (11 to 15 V DC) (4-pin)

DV connector : 4-pin

RS-232C : Mini DIN 6-pin

■ **GENERAL**

Power consumption : 18W with VF-P115B (when recording)

Mass : Approx. 5.0 kg (with lens, viewfinder, battery, videocassette). Approximately 2.9 kg (main unit only)

Operating temperatures: 0 °C to 40 °C (32°F to 104°F)

Operating humidity : 30 % RH to 80 % RH

Storage temperatures: -20 °C to 60 °C (-4°F to 140°F)

■ **ACCESSORIES**

Microphone	: x 1
Tripod base	: x 1
Lithium battery	: x 1 (CR2032)
Head cleaning tape	: x 1
Instruction Manual	: x 1
Precautions for Use of Head Cleaning Tape	: x 1

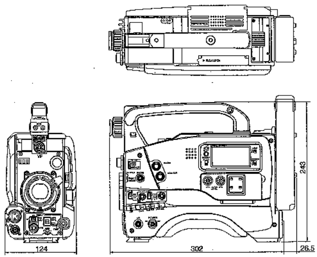
Design and specifications are subject to change without notice.

14-3 Specifications (Cont'd)

OPTIONAL ACCESSORIES

Viewfinder	: VF-P115B, VF-P116
Power zoom lens	: S14 x 7.3B12, S16 x 6.7B12, S19 x 6.5B12 (FUJINON) YH14 x 7.3K12, YH18 x 6.7K12 (CANON)
AC power adapter	: AA-P250
Microphone	: MV-P615
Microphone holder	: KA-A50

EXTERNAL DIMENSIONS (unit: mm)



* Design and specifications are subject to change without notice.

SECTION 1
SERVICE CAUTIONS AND DISASSEMBLY

1.1 RESETTING THE POWER CIRCUIT PROTECTION BREAKER

This unit employs a power circuit protection breaker in place of a fuse to disconnect from the main power and to thus protect the internal circuitry from damage caused by any current overload. The power can be re-connected by resetting the breaker.

> To prevent any complications resulting from the failure, check the cause of the shutdown and repair it before resetting the circuit breaker.

(1) Switch OFF the POWER of this unit as well as that of any equipment supplying power to it.
(2) The circuit breaker Ⓐ is located below the VCR at the rear. Press the BREAK button to re-connect the power line.

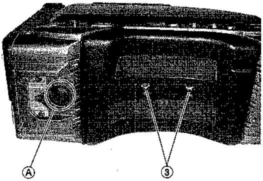


Fig. 1-1 Position of the Circuit Breaker

1.2 REMOVING THE EXTERIOR COVERS

1.2.1 Removing the Left Side Cover

(1) Open the cassette door by pressing the EJECT switch.
(2) Loosen the 4 screws ① and remove the left side cover.

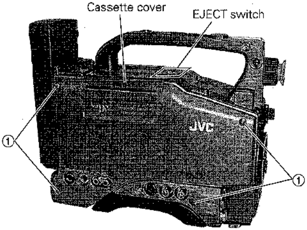


Fig. 1-2-1 Removing the Left Side Cover

1.2.2 Opening the Right Side Cover

(1) Loosen the 4 screws ②.

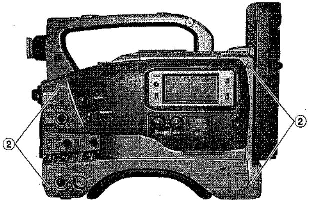


Fig. 1-2-2(1) Opening the Right Side Cover

(2) Flip open the right side cover toward the front.

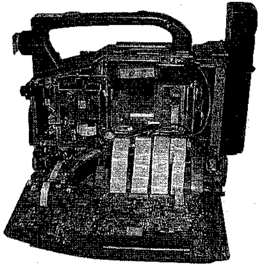


Fig. 1-2-2(2) View of the Opened Right Side Cover

1.2.3 Removing the Bottom Cover

(1) Remove the left side cover (see section 1.2.1).
(2) Remove the 2 screws ③ and remove the shoulder pads (see Fig. 1-1).
(3) Remove the 4 screws ④ and remove the bottom cover.

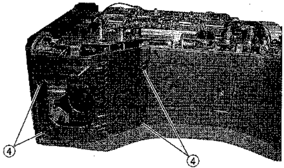
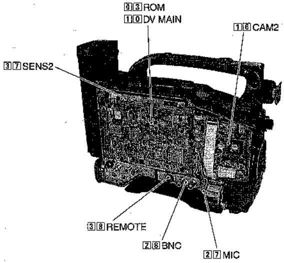


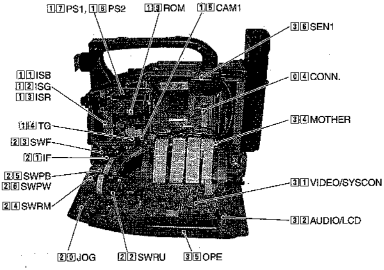
Fig. 1-2-3 Removing the Bottom Cover

1.3 LAYOUTS OF THE MAJOR BOARDS

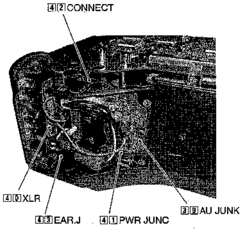
On the side of the left-hand side cover


03 ROM
10 DV MAIN
16 CAM2
37 SENS2
38 REMOTE
28 BNC
27 MIC

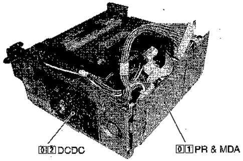
On the side of the right-hand side cover


17 PS1, 18 PS2
19 ROM
15 CAM1
36 SEN1
11 ISB
12 ISG
13 ISR
04 CONN.
14 TG
34 MOTHER
23 SWF
21 IF
25 SWPB
26 SWPW
24 SWRM
31 VIDEO/SYSCON
32 AUDIO/LCD
20 JOG
22 SWRU
35 OPE

On the side of the bottom cover


42 CONNECT
40 XLR
43 EAR.J
41 PWR JUNC
39 AU JUNK

VCR section


02 DCDC
01 PR & MDA

1.4 REMOVING THE OPTICAL BLOCK ASSEMBLY AND THE OPTICAL FILTER ASSEMBLY

(1) Remove the right side cover (see section 1.2.2).

(2) Remove the screw ① retaining the ROM board.

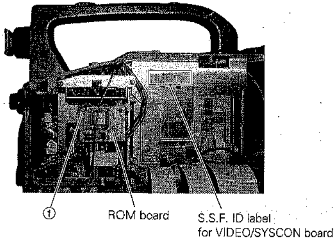


Fig. 1-4-1

(3) Remove the 4 screws ②.

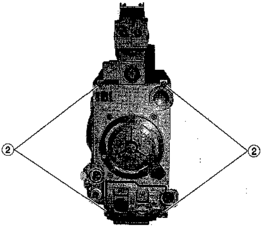


Fig. 1-4-2

(4) Pull out the optical block assembly and the front panel together toward the front.

CAUTION
Be careful not to damage the boards or the FC cables.

(5) Loosen the 2 screws ③ and remove the connector Ⓐ.

(6) Remove the optical filter assembly in the direction of the arrow.

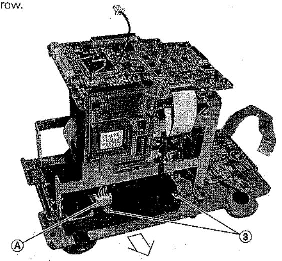


Fig. 1-4-3

(7) Remove the 4 screws ④ and remove the TG board and CP board mounting brackets.

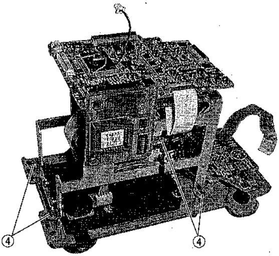


Fig. 1-4-4(1)

(8) Flip open CN11, CN12 and CN13 and unplug the flexible cables.

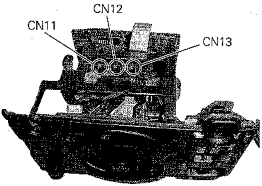


Fig. 1-4-4(2)

(9) Remove the 4 screws ⑤and separate the optical block assembly from the front panel.

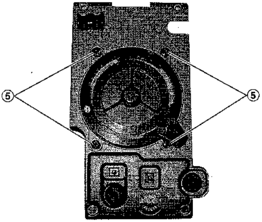


Fig. 1-4-5

NOTES

- The CCDs are bonded precisely to the prism. In case of trouble with a CCD, it is not possible to replace an individual CCD, but the entire optical block assembly should be replaced.
- The optical block assembly supplied as a service part (SCM1049-N0A (NTSC)/P0A (PAL)) is not equipped with the DR board. When replacing the optical block assembly, attach the surrounding PC boards to the new assembly before mounting it in the camera.

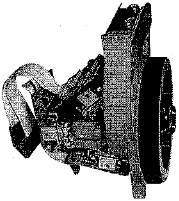


Fig. 1-4-6 Optical Block Assembly for Servicing

CAUTION

When mounting the optical block assembly in the camera, take care of the positioning of the wire assembly. A malfunction may occur if a wire is somehow caught up.

1.5 REMOVING MAJOR BOARDS FROM THE CAMERA

1.5.1 Removing the CP and TG Boards.

(1) Remove the right side cover (see section 1.2.2).

(2) Remove the 4 screws retaining the front panel (see section 1.4.3).

(3) Pull out the optical block assembly and the front panel together toward the front.

(4) Remove the screw retaining the ROM board. Now the ROM board can be removed.

(5) Remove the 4 screws①. Now the CP board can be removed.

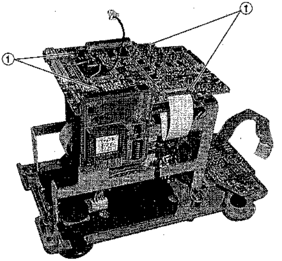


Fig. 1-5-1(1)

(6) Remove the CP board, then remove the 4 stud screws ④. Now the TG board is disengaged from the stay.

(7) Unplug the flexible cables connecting the IS boards and the TG board. Now the TG board can be removed.

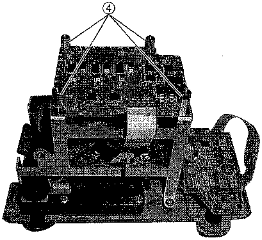


Fig. 1-5-1(2)

1.5.2 Removing the CAM1 Board

(1) Remove the left side cover (section 1.2.1).

(2) Remove the 6 screws ②.

(3) The DV MAIN board on the VCR side and the CAM2 board are connected by a board-to-board connector. Open the two boards together in the direction of the arrow.

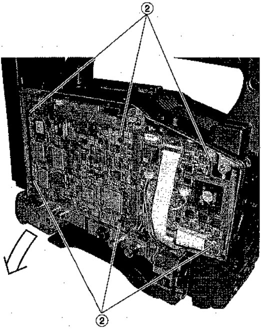


Fig. 1-5-2(1)

(4) The opened boards can be secured by fitting them into the notches on the VCR side frame as shown in the figure.

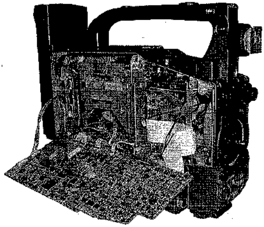


Fig. 1-5-2(2)

The operation of the VCR can be confirmed when the circuit boards are tilted.
When the circuit boards are tilted, take care that the electrical circuitry on each board is not short-circuited by the BNC connector located below the board.

1.5.3 Removing the SW Boards

(1) Open the right side cover (see section 1.2.2).

(2) The JOG, SWRU, SWRM, SWPW and SWRB boards are attached on the right side cover. Remove them as required.

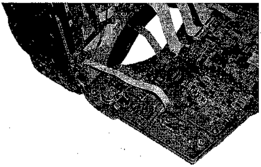


Fig. 1-5-3

1.5.4 Removing the PS 1 & 2 board.

(1) Open the right side cover (see section 1.2.2).

(2) Remove the 2 screws ③ retaining the PS 1 & 2 board.

(3) Pull out the PS 1 & 2 board, along the guide rail in the direction of the arrow.

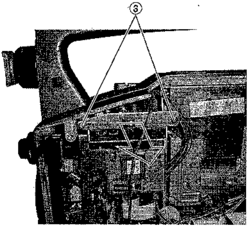


Fig. 1-5-4

1.6 REMOVING THE MAJOR BOARDS FROM THE VCR

1.6.1 Removing the VIDEO/SYSCON Board and Audio/LCD Board

(1) Open the right side cover (see section 1.2.2).
The VIDEO/SYSCON board is clamped to the right side cover.
(2) Remove the 2 screws ①. Now the VIDEO/SYSCON board can be removed.

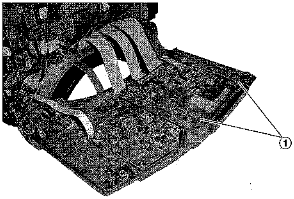


Fig. 1-6-1(1)

(3) After removing the VIDEO/SYSCON board, remove the 6 screws ② and 2 studs ③. Now the AUDIO/LCD board can be removed.

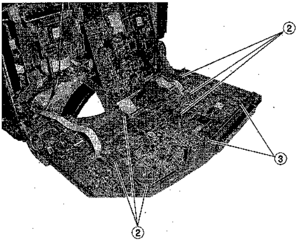


Fig. 1-6-1(2)

1.6.2 Removing the VCR Unit

(1) Remove the left side cover (see section 1.2.1).
(2) Remove the 4 screws ④.
(3) Pull out the VCR unit gently in the direction of the arrow. As the VCR unit is connected to the CAM2 board with a board-to-board connector, disconnect it gently.

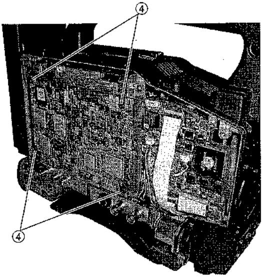


Fig. 1-6-2(1)

(4) Remove the EJECT switch wire Ⓐ and power supply wire Ⓑ.

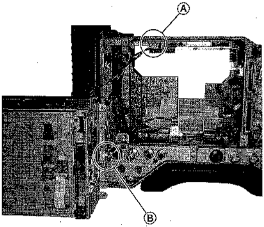


Fig. 1-6-2(2)

1.6.3 Removing the DV MAIN Board

(1) Remove the VCR unit (see section 1.6.2).
(2) Remove the 4 screws ⑤.
(3) Now the DV MAIN board can be removed.

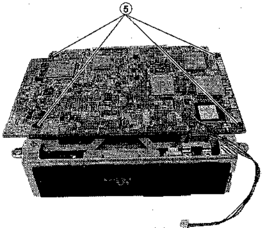


Fig. 1-6-3(1)

(4) After removing the DV MAIN board, leave it standing up by fitting it into the notches on the unit frame, as shown in the figure.

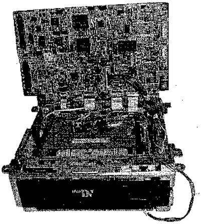


Fig. 1-6-3(2)

1.6.4 Removing the Battery Case

(1) Remove the 2 screws ① and remove the rear cover of the battery case.

(2) Remove the 4 screws ② and remove the battery case from the main unit.

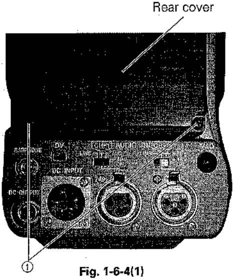


Fig. 1-6-4(1)

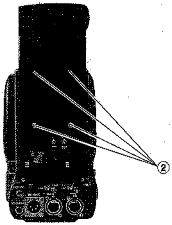


Fig. 1-6-4(2)

(3) Unplug the power cable that supplies power from the battery case to the main unit, from the connector ©.

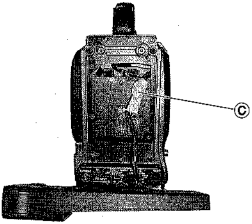


Fig. 1-6-4(3)

1.6.5 Removing the REG Board

(1) Remove the battery case (see section 1.6.4).

(2) Remove the 2 screws ③ and remove the panel.

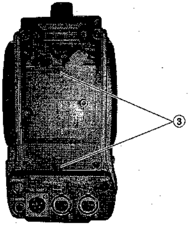


Fig. 1-6-5(1)

(3) Remove the 2 screws ④ and remove the REG board.

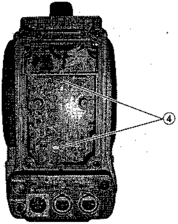


Fig. 1-6-5(2)

1.7 DISASSEMBLY OF THE VCR UNIT

The mechanism unit incorporated in the unit can be disassembled as described below. Note that the following description deals only with the method of removing the mechanism unit from the VCR unit.

1.7.1 Disassembling the Front Part of the Unit

(1) Remove the VCR unit from the camera (see section 1.6.2).
(2) Remove the DV MAIN board (see section 1.6.3).
(3) Remove the 2 screws ① and remove the stay on the front cover. The cover of the cassette insertion slot will come out together with it.

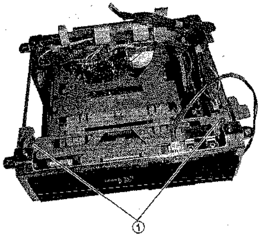


Fig. 1-7-1(1)

(4) Remove the 2 screws ② and remove the front stay.

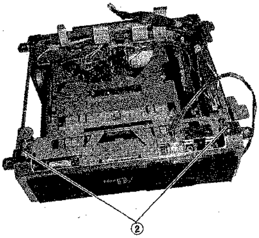


Fig. 1-7-1(2)

1.7.2 Disassembling the Rear Part of the Unit

(1) Remove the 2 screws ③ and remove the rear side stay.

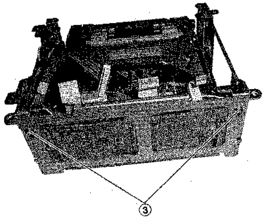


Fig. 1-7-2(1)

(2) Remove the 2 screws ④ and remove the active head cleaner. During this operation, be careful not to apply excessive force to the wire that is connected between the active head cleaner assembly and CN609 on the PR & MDA boards.

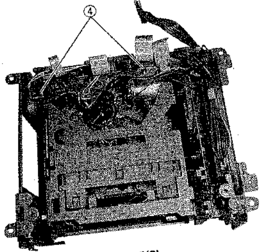


Fig. 1-7-2(2)

(3) Remove the 2 screws ⑤ and remove the side stays.

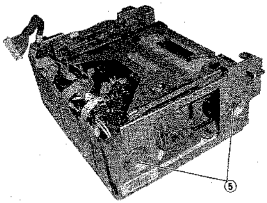


Fig. 1-7-2(3)

(4) Insulators (blue) are attached to the retaining screws. Be sure to attach the insulators when re-assembling the side stays.

(5) The side stays to both sides are attached in the same way. Remove the 2 screws ⑥ and remove the side stays.

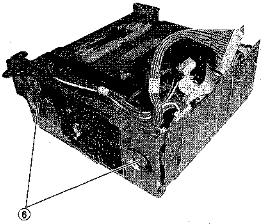


Fig. 1-7-2(4)

(6) After removing the rear stays and side stays (left and right), remove the 2 screws ⑦ then remove the PR & MDA board. When removing the PR & MDA boards, be careful not to damage the wires and FFCs connecting them to the deck assembly housing motor and power supply board.

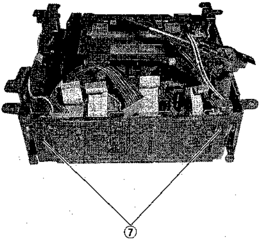


Fig. 1-7-2(5)

1.7.3 Removing the Cassette Housing Assembly

(1) Remove the 2 screws ⑥ and remove the cassette housing assembly.

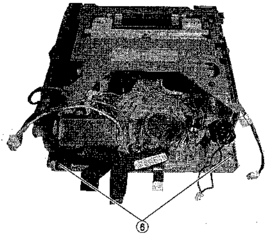


Fig. 1-7-3

1.7.4 Removing the Mechanism Unit

(1) Remove the 3 screws ⑧. This allows the mechanism unit to be removed from the stays When it is required to disassemble the mechanism unit itself, see SECTION 2.

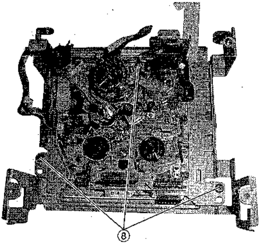


Fig. 1-7-4(1)

(2) When the remove the mechanism unit completely, also remove the connector Ⓐ from the rear.

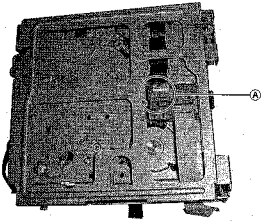


Fig. 1-7-4(2)

1.8 TAPE EJECTION IN CASE OF EMERGENCY

When the cassette tape cannot be ejected normally, take it out by the following methods.

1.8.1 Tape Ejection Using Forced Eject Mode (Short-circuiting of Internal TP)

GY-DV500 is provided with a compulsory eject mode for use in case the button operations are not accepted due to a malfunction of the mechanism control circuitry. When an attempted operation of the operation buttons is not accepted, set the compulsory eject mode as described below before removing the tape.

CAUTION

- This mode is effective only when the electrical and mechanical systems of the mechanism unit are normal and a tape ejection operation is not accepted due to a problem of the electrical system.
- If there is a problem in the mechanical system of the unit, this mode may be ineffective. If compulsory ejection is performed in such a case, the tape could be damaged or cut.

(1) Remove the left side cover (see section 1.2.1).
(2) With the power supply on, short-circuit TP107 on the DV MAIN board with the GND using a wire, etc.
(3) Forced ejection is activated to eject the tape.

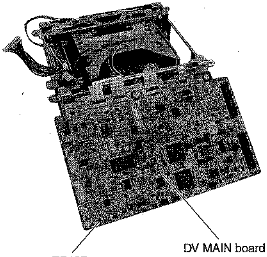


Fig. 1-8-1

1.8.2 Tape Ejection without Using the Forced Eject Mode

Activate the loading motor by applying DC voltage to its two terminals.

NOTE

When a forced ejection is not accepted because the loaded cassette tape cannot be ejected due to a fault in the electrical system or because of some problem in the mechanism unit, eject the tape by using the following procedure.
However, as this mode drives the loading motor, it assumes that the mechanical system is operating normally.

(1) Turn off the power supply to the unit.
(2) Flip open the DV MAIN board to expose the mechanism (see section 1.6.3).
(3) Apply 3 V DC to the electrodes at the top of the loading motor (red wire to + pole, brown wire to - pole) to unload the tape. Unload it little by little because it could be damaged or contaminated by grease if the pole base assemblies are returned completely beyond the position of the tape.

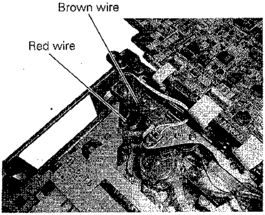


Fig. 1-8-2(1)

(4) If the tape slackens, take it up by rotating the shaft at the top of the capstan motor in the direction of the arrow using a sharp-tipped object (chip IC replacement tool, etc.).
(5) Repeat steps (3) and (4) above until the tape is taken up completely.
(6) After confirming that the tape has been taken up completely, rotate the gear of the cassette housing assembly in the direction of the arrow in order to eject the cassette tape.

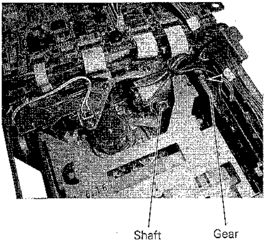


Fig. 1-8-2(2)

1.8.3 Manual Tape Ejection

If the loading motor cannot be run by the procedure outlined in section 1.8.2, the mechanism may be defective. When the loading motor is defective, remove the tape as described below.

(1) Remove the mechanism unit from the main unit. See section 1.6.2 for the removal method.
(2) After removing the mechanism unit, remove the DV MAIN board (see section 1.6.3).
(3) Remove the 2 screws and remove the active head cleaner assembly (see section 1.7.2).
(4) Remove the side cover to easy operation (see section 1.7.2).
(5) Remove the 2 screws and remove the rear panel from the side of the PR & MDA board.
Carefully unplug the wires so as not to damage them, then remove the PR & MDA board (see section 1.7.2).

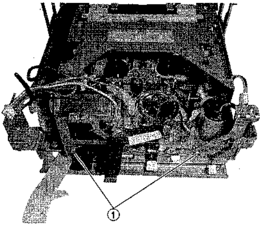


Fig. 1-8-3(1)

(6) Remove the 2 screws ① and remove the active head cleaner stay.

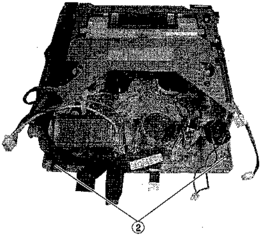


Fig. 1-8-3(2)

(7) Loosen the 2 screws ② so that the cassette housing is separated freely.
(8) Remove the 4 screws ③ and remove the loading motor.

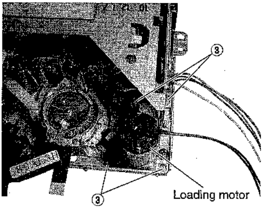


Fig. 1-8-3(3)

(9) Unload the pole base assemblies by rotating the gear shown in the figure in the direction of the arrow.

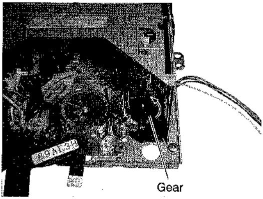


Fig. 1-8-3(4)

(10) The pole base assemblies should be unloaded little by little. If they are returned completely beyond the position of the tape, the tape may slacken and become damaged or stained by grease.
(11) If the tape slackens, take it up by rotating the shaft on the top of the capstan motor in the direction of the arrow using a sharp-tipped object (chip IC replacement tool, etc.) (see section 1.8.2-(4)).
(12) Repeat steps (9) and (10) above until the tape is taken up completely.
(13) After confirming that the tape has been taken up completely, tighten the cassette housing retaining screws which were loosened in step (6).
(14) Attach and clamp the cassette housing again, then rotate the gear of the housing assembly in the direction of the arrow to eject the cassette tape in the same way as in section 1.8.2-(6).

1.9 CAUTION FOR REPLACING THE DV MAIN BOARD AND VIDEO SYSCON BOARD

When the DV MAIN board or VIDEO SYSCON board has been replaced for servicing, be sure to enforce the following items.

1.9.1 DV MAIN Board

[A] About the ID Management Label

Each VCR unit carries an ID label in compliance with IEEE1394 showing the unique ID assigned on the production line.
(See the following figure for the label position.)
When replacing the DV MAIN board, remove the ID management label that was provided originally with the unit from the defective board and attach it in the same position to the new board.

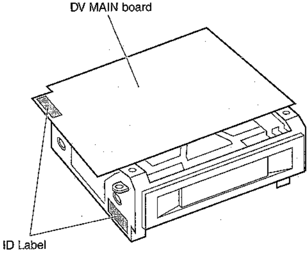


Fig. 1-9-1

[B] Load EEPROM Internal Data

The EEPROM provided with the new board for replacement contains no data, while the EEPROM originally provided with the VCR unit contains the IEEE1394 ID data as well as all adjustment data written in the assembly and adjustments written on the production line. This means that the new VCR unit will not function if the new EEPROM is used in the condition in which it is delivered.
When replacing the DV MAIN board, load the internal data of the EEPROM on the original board to the EEPROM of the new board.

(1) How to use original EEPROM to new DV MAIN board.
Remove the EEPROM from the original DV MAIN board, and attach the chip to the new board.

(2) How to write data from the original board to the new EEPROM
How to load all parameters in EEPROM on original board to new EEPROM by using the adjustment software.
(For details, see section 3.7.13)

(3) In case of original EEPROM on the original DV MAIN board was broken.
Load the default data before making adjustments with the adjustment software, write the data in the new EEPROM, then make adjustments by following the adjustment procedures. (See section 3.7.12 for details.)
And then, input the ID number on the original board to new EEPROM by using the adjustment software. (See section 3.7.13 for details.)

1.9.2 VIDEO SYSCON Board

[A] Transporting of IC407 (EEPROM) Data

When the SSF function is used, the cassette number recorded on tape (see section 9.4.1) has the model ID code appended to it. The model ID code is written in IC407 (EEPROM). However, as the new EEPROM mounted on the new replacement circuit board does not have the ID code written into it, the SSF function cannot work normally (the model ID code should be written in IC407 for the correct operation of the SSF function).
Nevertheless, no means is provided for transporting the model ID code from the original EEPROM to the new EEPROM. Therefore, it is recommended to remove the original IC from the original board and mount it on the new board.

[B] ID Management Label

An ID management label is attached to the camera head. For the position, see Fig. 1-4-1.

1.10 FUNCTIONS OF INTERNAL SWITCHES

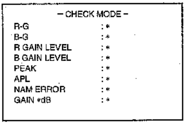
1.10.1 DIP Switch S901 on ROM Board

Symbol	No.	Name	Function	Shipment
S901	1	Adjustment mode	Adjustment mode ON/OFF	OFF
	2	Check mode	Check mode ON/OFF	OFF
	3	Not used		OFF
	4	Character mixing	TEST OUT character display ON/OFF	OFF
	5	Not used		OFF
	6	Color matrix adjustment	Color matrix adjustment mode ON/OFF	OFF
	7	Setup (NTSC model only)	ON (0% setup)/ OFF (7.5% setup)	OFF
	8	Function setting	Initial setting of camera functions	OFF

Table 1-10-1

(1) Adjustment mode (S901-1)
Set S901-1 to ON to initiate the camera electrical adjustment mode.
For details, see section 3.3.

(2) Check mode (S901-2)
Set S901-2 to ON to display the camera's check mode screen on the viewfinder.
In this mode, the auto white balance and auto iris control data in the microcomputer controlling the camera can be viewed and checked. (This mode is not used for adjustments but is intended to simply allow the checking of control values and their functions.)



```
      – CHECK MODE –
R-G                :*
B-G                :*
R GAIN LEVEL       :*
B GAIN LEVEL       :*
PEAK               :*
APL                :*
NAM ERROR          :*
GAIN *dB           :*
```

Fig. 1-10-1(1)

R-G/B-G
Shows the data on the R/G/B signals input to the CPU for use in white balance control in terms of R-G and B-G. The values are variable between -127 and 128.
These values approach 0 if the white balance circuit is activated by capturing a non-color image such as a gray scale.

R GAIN LEVEL/B GAIN LEVEL
Show the levels of the R and B channel white balance control signals.
These values are variable between 0 and 255.
The R value tends to decrease and the B value tends to increase under low color temperatures (reddish lighting), and the R value tends to increase and the B value tends to decrease under high color temperatures (bluish lighting).

PEAK
Shows the peak hold value of the video signal in a vertical scanning period.

APL
Shows the average picture signal level.

NAM ERROR
Shows the NAM value used in the auto iris control.
The value is variable between -127 and 128.
The value approaches 0 when the auto iris control approaches the optimum level.

GAIN
Shows the electrical gain value set with the GAIN switch on the right-hand side of the unit.
Shows "ALC" in the full auto-shooting mode.

(3) Character mixing (S901-4)

Set S901-4 to ON to superimpose the same characters as those displayed on the viewfinder-screen in the output signal from the TEST OUT terminal. This is a convenient facility for adjustment because the adjustment menu and screen can be displayed on an external monitor.

(4) Color-matrix adjustment (S901-6)

Set S901-6 to ON to view the color-matrix adjustment-mode screen on the Viewfinder-screen.

This mode makes it possible to set color-matrix parameters in details (see section 1.12).

* Note that the color-matrix adjustment is not a normal adjustment item. It is usually not required to adjust the color-matrix because this has been set to the optimum level before shipment.

* In case a color-matrix adjustment becomes necessary because of a user's request, it should be performed in accordance with the description in section 1.2.

(5) Setup (S901-7): NTSC only

Set S901-7 to ON or OFF to select whether or not the output signal setup is included in the TEST OUT and MONITOR OUT terminals output.

(Note that the signal recorded onto tape is not affected by the position of this switch. The signal is always recorded without the setup information.)

As changing the position of this switch does not alter the signal level, it is not necessary to re-adjust the signal recording according to the position of this switch. This switch is effective only on the camera video output. With the video signal obtained by playing back a previously recorded tape, whether the setup is included or not can be selected with the item "SETUP" in the Service Menu (see section 1.13.3).

(6) Function setting (S901-8)

This switch is used to set the functions shown in Table 1-9-1(2).

This switch is usually used to switch the defaults of the domestic and export-oriented models.

Function		S901-8		
		NTSC		PAL
		OFF	ON	Do not care
GAIN	L	0 dB	0 dB	0 dB
	M	6 dB	9 dB	9 dB
	H	9 dB	18 dB	18 dB
V. SCAN		60.1 to 251.3	60.1 to 2067.0	50.1 to 2053.6
ALC GAIN		0 to + 18 dB	0 to + 18 dB	0 to + 18 dB

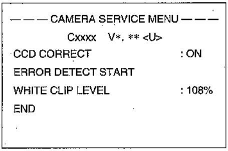
Table 1-9-1(2)

* The L/M/H positions of GAIN can also be set individually using the [CAMERA MENU].

1.11 MODES REQUIRED IN SERVICING

1.11.1 Camera Service Menu

The CAMERA SERVICE MENU can be displayed on the viewfinder screen by setting the [POWER] switch to ON while tilting the AUTO WHITE/ACCU FOCUS switch upward (toward AUTO WHITE).



```
——— CAMERA SERVICE MENU ———
        Cxxxx   V*. ** <U>
CCD CORRECT                 : ON
ERROR DETECT START
WHITE CLIP LEVEL            : 108%
END
```

Fig. 1-11-1

Select an item by turning the SHUTTER dial, and push the SHUTTER dial to select or set it.

Cxxxx V*.**<U>

This item displays the version number of the camer control software (IC902 on ROM board).

* The Character "U" after the Version No. indicates that U version software is running. When "E" is shown here, the software for E version is running.

CAUTION

Also be sure to reset the system after replacing IC902 (ROM) on the ROM board. See section 1.11.2, "System Reset".

CCD CORRECT (ON/OFF)

This item sets whether white blemish due to CCD is to be corrected or not.

To correct : ON

Do not correct : OFF

The factory shipment condition is ON. Even when OFF is selected with this menu, it is temporary and the correction status (ON) is recalled automatically the next time the power is turned on.

NOTE

- To correct any white blemish interference produced after the factory shipment, perform the "ERROR DETECT START" described on the next page. Be sure to warm up the camera by leaving it on for more than 2 hours before performing the "ERROR DETECT START".

- The white blemish correction is performed with the lens iris closed or with the lens cap on. In normal use, the lens iris closes automatically when performing a white blemish correction. However in a case when the lens cable is disconnected and the lens iris cannot be closed, "ERROR DETECT FAIL" will be displayed on the viewfinder and the white blemish correction cannot be executed. Before performing the white blemish correction again, be sure to first close the lens.

ERROR DETECT START

When this item is selected and the SHUTTER dial is pushed, the white blemish detection for correcting CCD white blemish starts automatically.

The following messages are displayed on the viewfinder screen during detection.

ERROR DETECT EXECUTING
↓
ERROR DETECT END

After the completion of error detection, the camera is automatically set to the white blemish correction ON condition.

The following types of white blemish can be corrected.

(1) White blemish correction target area

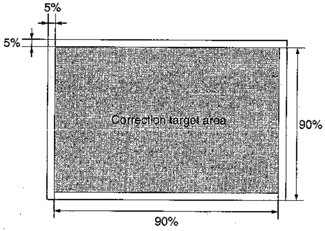


Fig. 1-11-2

(2) Details of correctable white blemishes

- White blemishes at luminance levels of 30 mV or more can be corrected. The total number of white blemishes that can be corrected is up to 7 for the R, G and B signals.
- Even when there are 2 white blemishes on a single scanning line, both of them can be corrected. (However, when they are adjacent, the results of a correction appear inferior to those of the results of the correction of a single white blemish. These results are due to the correction characteristics themselves.)

WHITE CLIP

The white clip level of the through-camera composite output signal that is output at TEST OUT can be selected from the following 2 values:

100% or 108% (shipment setting)

1.11.2 System Reset

While pushing the [SHUTTER] dial, press the [POWER] switch to ON. This resets the system and initializes the menu set items to their default values.

The following description shows items that are initialized to the defaults by a system reset and those that are not.

1.11.3 Resetting DSP Data

While pushing the [SHUTTER] dial and [STATUS] switch tilted toward "SKIN AREA", press the [POWER] switch to ON. This resets the internal setting data (color matrix setting data) in the DSP to the default setting.

1.11.4 Displaying Auto Iris Area Gate

While holding the [AUTO WHITE/ACCU FOCUS] switch down (toward ACCU FOCUS), press the [POWER] switch to ON. The area gate for the auto iris control is displayed in the viewfinder screen.

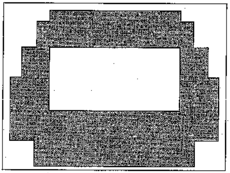


Fig. 1-11-3

1.11.5 List of Servicing Switches (Camera)

The following table that shows the switches described above is for use in servicing. Use this table as a reference in servicing.

Switch Operation	Result
[AUTO WHITE] + [POWER] ON	Service menu display
[SHUTTER] + [POWER] ON	System reset
[STATUS] + [SHUTTER] + [POWER] ON	DSP data reset
[ACCU FOCUS] + [POWER] ON	Area gate display

Table 1-11-4

1.11.6 EEPROM in Camera

IC905 on the CAM1 board is an electrically erasable/rewritable EEPROM. It stores the following data.

- Camera adjustment data set in the adjustment mode.
- Settings in [CAMERA MENU].
- White blemish position coordinate data for use in white blemish correction.
- Auto white balance control data (A/B).
- Camera status at the last power OFF (positions of non-lock type switches, etc.).

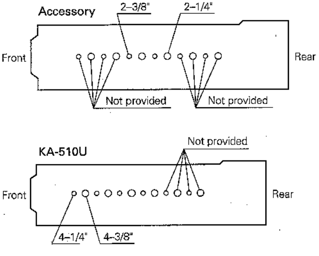
Therefore, when retention of the above data becomes impossible due to a failure in the EEPROM or over the 1 million times of rewrite count, the EEPROM should be replaced with a new one and the data should then be re-set in it.

1.11.7 Tripod base

See the KA-510U servide manual NO. 60065 for servicing.
The tripod is not exactly same as KA-510U. See note for the difference.

Note

These 1/4 and 3/8 inch fixing tripod holes are not povided for the KA-510U.



1.12 CHANGING THE COLOR MATRIX SETTING

NOTE

The color reproduction properties of the color-matrix circuit built into the DSP can be re-set by varying the values of 9 parameters. However, as these parameters have been set at the factory to the default values based on detailed studies of the product development process, it is usually not recommended to alter them. Note that this adjustment is not a normal electrical adjustment item.
Should a re-adjustment of the color matrix (a color reproducibility change) be required as a result of a user request, etc., this should be performed only after studying and understanding the details of the following instructions.

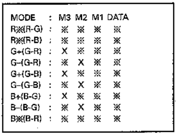
1.12.1 Setting the Color Matrix

Preparation

The color matrix setting requires a color chart for use as a reference for color reproduction and a vectorscope. As we do not specify a color chart for this purpose, discuss the matter with any user requesting a custom setting and use a color chart to be agreed by the user.

Adjustment

The color-matrix circuit can be set using menus displayed on the screen (the viewfinder-screen or the test out screen).



```
MODE    : M3 M2 M1 DATA
R※(R-G) : ※  ※  ※   ※
R※(R-B) : ※  ※  ※   ※
G+(G-R) : X  ※  ※   ※
G-(G-R) : ※  X  ※   ※
G+(G-B) : X  ※  ※   ※
G-(G-B) : ※  X  ※   ※
B+(B-G) : X  ※  ※   ※
B-(B-G) : ※  X  ※   ※
B※(B-R) : ※  ※  ※   ※
```

Fig. 1-12-1

Use the following procedure.

(1) Remove the right side cover (see section 1.3.1)

(2) Set DIP switch S901-6 on the ROM board to ON to display the color-matrix setting menu on both the viewfinder and testout screens.

(3) Move the cursor (mark of "▒") to the desired item by using the [SHUTTER] dial.

(4) When the cursor set on the desired item, pushing the [SHUTTER] dial causes the selected item to blink. (This is the status of the value adjustment.)

(5) When the adjustment value is blinking, rotating the [SHUTTER] dial varies the adjustment value. The available adjustment values are "M3", "M2", "M1" which is 0 or 1, and "DATA" which is between 0 and 31.

(6) Set DIP switch S901-6 on the ROM board to OFF. The color-matrix setting menu is canceled and the normal screen appears again.

NOTE

The settings are stored and reflected every time a value in an item is changed. The setting values marked "X" do not need to be changed.

NOTE

If the [STATUS] switch is pressed during the value of some adjustment item is blinking, all of the data being set is reset to the default values.

1.12.2 Details of Setting Items

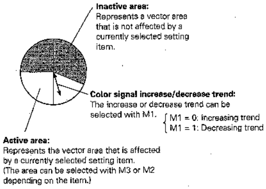
As described above, the color matrix setting consists of varying 12 items using 9 parameters. The following table shows a comparison of the setting items.

NOTE

The model diagrams in the table may be interpreted as follows.

(Example)

This diagram represents the display area of the vectorscope.


Inactive area:
Represents a vector area that is not affected by a currently selected setting item.
Color signal increase/decrease trend:
The increase or decrease trend can be selected with M1.
M1 = 0: Increasing trend
M1 = 1: Decreasing trend
Active area:
Represents the vector area that is affected by a currently selected setting item.
(The area can be selected with M3 or M2 depending on the item.)

MODE	Active Area Graph display	M3 0 : Active 1 : Inactive	M2 0 : Active 1 : Inactive	M1 0 : Increase 1 : Decrease	DATA 0 – 31
R±(R-G)	M3	0 or 1		0 or 1	※
	M2		0 or 1		
R±(R-B)	M3	0 or 1		0 or 1	※
	M2		0 or 1		
G+(G-R)	M2	×	0 or 1	0 or 1	※
G–(G-R)	M3	0 or 1	×	0 or 1	※
G+(G-B)	M2	×	0 or 1	0 or 1	※
G–(G-B)	M3	0 or 1	×	0 or 1	※
B+(B-G)	M2	×	0 or 1	0 or 1	※
B–(B-G)	M3	0 or 1	×	0 or 1	※
B±(B-R)	M3	0 or 1		0 or 1	※
	M3		0 or 1		

Table 1-12-1

1.13 SERVICE MENU

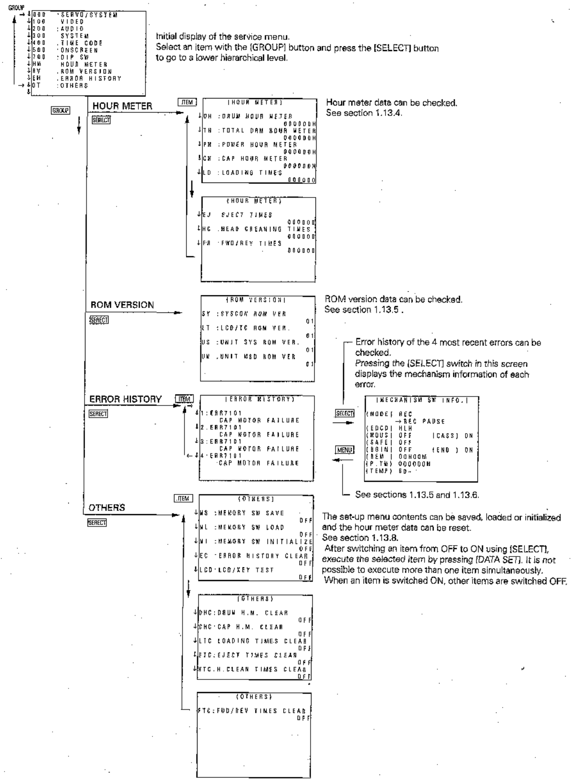
1.13.1 Operation Method

When the [MENU] button is pressed, the setup menu appears on the viewfinder screen to allow the user to perform setups. (For the contents of the setup menu, refer to page 66 of the instruction manual). Then, with the setup menu displayed, press the [MENU] button while holding down the [LOG] button to display the service menu.

To change a menu setting value, press the [DATA SET] button. The viewfinder screen and counter display show the blinking "DATA SET" indicators and the set returns to normal mode.

To return to the setup menu, turn the power off and then on again.

1.13.2 Configuration of the Service Menu (Displayed on the Viewfinder Screen)



```
000  :SERVO/SYSTEM
100   VIDEO
200  :AUDIO
300   SYSTEM
400  .TIME CODE
500  :ONSCREEN
700  :DIP SW
HM    HOUR METER
RV   .ROM VERSION
EH   .ERROR HISTORY
OT   :OTHERS
```

Initial display of the service menu.
Select an item with the [GROUP] button and press the [SELECT] button to go to a lower hierarchical level.

```
       (HOUR METER)
DH  :DRUM HOUR METER
                 000000H
TH  :TOTAL DRM HOUR METER
                 000000H
PH  :POWER HOUR METER
                 000000H
CH  :CAP HOUR METER
                 000000H
LD  :LOADING TIMES
                  000000
```

```
       (HOUR METER)
EJ   EJECT TIMES
                  000000
HC  .HEAD CLEANING TIMES
                  000000
FR  :FWD/REV TIMES
                  000000
```

Hour meter data can be checked.
See section 1.13.4.

```
       (ROM VERSION)
SY  :SYSCON ROM VER
                      01
LT  :LCD/TC ROM VER.
                      01
US  :UNIT SYS ROM VER.
                      01
UM  .UNIT MSD ROM VER
                      01
```

ROM version data can be checked.
See section 1.13.5 .

```
      (ERROR HISTORY)
1:ERR7101
    CAP MOTOR FAILURE
2.ERR7101
    CAP MOTOR FAILURE
3:ERR7101
    CAP MOTOR FAILURE
4·ERR7101
    CAP MOTOR FAILURE
```

Error history of the 4 most recent errors can be checked.
Pressing the [SELECT] switch in this screen displays the mechanism information of each error.

```
  (MECHANISM SW INFO.)
(MODE)  REC
        →REC PAUSE
(EDCD)  HLH
(MOUS)  OFF     (CASS) ON
(SAFE)  OFF
(BGIN)  OFF     (END ) ON
(REM )  00H00M
(P.TM)  000000H
(TEMP)  6D~
```

See sections 1.13.5 and 1.13.6.

```
         (OTHERS)
MS  :MEMORY SW SAVE
                     OFF
ML  :MEMORY SW LOAD
                     OFF
MI  :MEMORY SW INITIALIZE
                     OFF
EC  :ERROR HISTORY CLEAR
                     OFF
LCD·LCD/KEY TEST
                     OFF
```

```
         (OTHERS)
DHC:DRUM H.M. CLEAR
                     OFF
CHC·CAP H.M. CLEAR
                     OFF
LTC LOADING TIMES CLEAR
                     OFF
ETC:EJECT TIMES CLEAR
                     OFF
HTC.H.CLEAN TIMES CLEAR
                     OFF
```

```
         (OTHERS)
FTC:FWD/REV TIMES CLEAR
                     OFF
```

The set-up menu contents can be saved, loaded or initialized and the hour meter data can be reset.
See section 1.13.8.
After switching an item from OFF to ON using [SELECT], *execute the selected item by pressing [DATA SET]. It is not* possible to execute more than one item simultaneously.
When an item is switched ON, other items are switched OFF.

1.13.3 Contents of Service Menu

Group	Item	Settings	Counter Display		Factory Default	Description
000 SERVO/ SYSTEM	002: OPERATION LOCK	ON OFF	002	01 00	OFF	Operation lock setting.
	050: REMOTE SELECT	LOCAL IEEE1394 RS232C	rMSL	Lc iE 23	LOCAL	User setup menu (Refer to page 68 of the instruction manual.)
	080: BATTERY SHUTDOWN V	10.5 – 11.0V (0.1V step)	bE	105	10.5V	Battery empty detection voltage setting.
	081: BATTERY ALARM V	10.5 – 12.0 V (0.1V step)	bA	110	11.0V	Battery alarm detection voltage setting.
	082: BACK TALLY MODE	BLINK OFF ON	rtMd	bL oFF on	BLINK	User setup menu (Refer to page 68 of the instruction manual.)
	083: FRONT TALLY MODE	BLINK ON	083	03 01	BLINK	Select the front tarry BLINK: Blinking ON: Lighting
100 VIDEO	125: SET UP (Only U-ver.)	OFF ON	125	00 01	ON	Select the setup of MONITOR OUT in playback mode. ON: Setup added. OFF: No setup.
	126: INPUT SELECT	CAMERA IEEE1394	ud	cM iE	CAMERA	Input signal selection User setup menu (Only U-ver.) (Refer to page 68 of the instruction manual.)
200 AUDIO	244: LOW CUT	OFF CH1 CH2 CH1&CH2	LctF	oF 01 02 on	OFF	User setup menu (Refer to page 68 of the instruction manual.)
	245: SAMPLING RATE	32K 48K	SMPL	48 32	48K	User setup menu (Refer to page 68 of the instruction manual.)
	246: FRONT VOLUME ENABLE	DISABLE ENABLE	FruL	oF on	ENABLE	User setup menu (Refer to page 68 of the instruction manual.)
300 SYSTEM	303: WARNING DISABLE	ENABLE DISABLE	303	00 01	ENABLE	ENABLE: Warning enabled. DISABLE: Warning disabled.
	305: REC REPEAT	OFF ON	305	00 01	OFF	OFF: REC Full Repeat enabled. ON: REC Full Repeat disabled.
	306: LONG PAUSE DISABLE	ENABLE DISABLE	306	00 01	ENABLE	ENABLE: Long pause is canceled after specified period of time (set using Menu 307). DISABLE: Long pause is not canceled.
	307: LONG PAUSE TIME	3MIN 30MIN	LGPt	03 30	30MIN	User setup menu (Refer to page 68 of the instruction manual.)
	396: BATTERY TYPE	12V 13.2V 14.4V	bAtt	12 13 14	12V	User setup menu (Refer to page 68 of the instruction manual.)
	398: SSF MODE	OFF CUE MODE MARK MODE	SSF	oF cU Mr	CUE MODE	User setup menu (Refer to page 68 of the instruction manual.)
400 TIME CODE	406: USERS BIT GROUP	NOT SPECIFIED ISO CHAR UNASSIGNED1 UNASSIGNED2	40b	00 01 02 03	NOT SPECIFIED	User bit's binary group flag setting
	416: NON DROP/DROP (Only U-ver.)	DROP NON DROP	tcG	dF nF	DROP	User setup menu (Refer to page 68 of the instruction manual.)
500 ON SCREEN	515: CALENDAR SELECT	JAPAN USA EUROPE	515	00 01 02	U-ver: USA E-ver: EUROPE	Calendar display format selection. JAPAN: Year/Month/Day USA: Month/Day/Year EUROPE: Day/Month/Year
	516: DISPLAY SELECT	TC CLOCK	dSP	tc cL	TC	User setup menu (Refer to page 68 of the instruction manual.)

Group	Item	Settings	Counter Display	Factory Default	Description
700 DIP SW	700: DIP SWITCH-0	OFF ON	700 00 01	OFF	Operate LED display switching OFF: Blinks in amber when the cassette cover is opened. ON: Extinguished when the cassette cover is opened.
	701: DIP SWITCH-1	OFF ON	701 00 01	OFF	OFF: Other operations than ejection are inhibited when the cassette cover is opened. ON: Operations are valid even when the cassette cover is opened.
	702: DIP SWITCH-2 to 715: DIP SWITCH-15	OFF ON	702 00 to 01 715 00 01	All OFF	Switching inhibited. Must be set to OFF.

Operations are not accepted when the cassette cover is open. Therefore, DIP switch-0 and -1 can be used in checking the operation when the side cover is open or in the compatibility adjustment.

1.13.4 HOUR METER

This screen allows the data of hour meters to be checked.

Item	Counter Display	Description	Max. Display Hours/Count
DRUM HOUR METER	dH******	Displays the drum rotation hours.	999999H
TOTAL DRM HOUR METER	tH******	Displays the total drum rotation hours. This data cannot be reset.	999999H
POWER HOUR METER	PH******	Displays the power ON hours. This data cannot be reset.	999999H
CAP HOUR METER	cH******	Displays the capstan motor rotation hours.	999999H
LOADING TIMES	LH******	Displays the loading count.	999999TIMES
EJECT TIMES	EJ******	Display the ejection count.	999999TIMES
HEAD CLEANING TIMES	Hc******	Displays the active cleaning head operation count.	999999TIMES
FWD/REV TIMES	Fr******	Displays the forward or reverse operation count	999999TIMES

****** are the figures of time (or count).

1.13.5 ROM VERSION

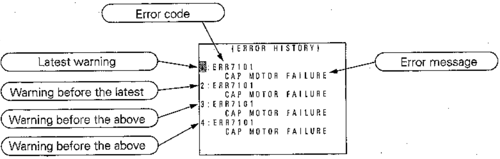
This screen allows the ROM versions to be checked.

Item	Counter Display	Board Name Symbol No.	Remark
SYSCON ROM VER.	SY **	Video/Sys-con board IC403	PLSL1063-V1-**
LCD/TC ROM VER.	Lt **	Audio/LCD board IC601	UPD78P058BT***
UNIT SYS ROM VER.	US **	DV MAIN board IC101	MN102F1617HL-**
UNIT MSD ROM VER.	Un **	DV MAIN board IC401 ROM board IC1 (The MSD CPU program is written in IC401 and ROM board IC1.)	M31020EAVP-*** M27W102-80N6-** (The ROM version No. of PAL begins with "80".)

** is the version number.

1.13.6 ERROR HISTORY

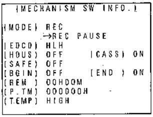
This screen allows the history of the 4 most recent errors to be checked.



```
   (ERROR HISTORY)
1:ERR7101
    CAP MOTOR FAILURE
2:ERR7101
    CAP MOTOR FAILURE
3:ERR7101
    CAP MOTOR FAILURE
4:ERR7101
    CAP MOTOR FAILURE
```

1.13.7 MECHANISM SW INFO

This screen allows the mechanism mode at each error to be displayed.



```
  (MECHANISM SW INFO.)
(MODE) REC
      →REC PAUSE
(EDCD) HLH
(HOUS) OFF     (CASS) ON
(SAFE) OFF
(BGIN) OFF     (END ) ON
(REM ) 00H00M
(P.TM) 000000H
(T.EMP) HIGH
```

Display

Item	Description	Input Pin	Display
(MODE)	Mode at the moment of VCR error & mode immediately before.	—	PLAY, STILL, REC, REC PAUSE, NO CASSETTE, EJECT, STNDBY-ON, FF, REW, SHTL, STILL, SHTL X10, SHTL X-10
(ECOD)	Rotary encoder output.	DV MAIN board IC401 Pin 44 → CAM0 Pin 45 → CAM1 Pin 46 → CAM2	Shows H or L according to the mechanism position. Rotary encoder terminal (ENCD) H L H CAM0 CAM1 CAM2
(HOUS)	Cassette housing switch status.	DV MAIN board IC401 pin 27	ON : Housing inserted/ejected status OFF : Housing operating status
(CASS)	Cassette switch status.	DV MAIN board IC401 pin 32	ON : Cassette tape inserted OFF : Cassette tape not inserted or during insertion /ejection
(SAFE)	REC safety switch status.	DV MAIN board IC401 pin 47	ON : Non-recordable tape inserted, cassette tape not inserted or during insertion /ejection OFF : Recordable tape inserted
(BGIN)	Tape begin sensor status.	DV MAIN board IC401 pin 126	ON : Tape leader section detected OFF : Magnetic tape section detected
(END)	Tape end sensor status.	DV MAIN board IC401 pin 125	ON : Tape leader section detected OFF : Magnetic tape section detected
(REM)	Remaining tape at the moment of error.	—	Remaining tape time
(P.TM)	POWER HOUR METER data at the moment of error.	—	POWER HOUR METER time
(TEMP)	Set's internal temperature at the moment of error	DV MAIN board IC101 pin 75	UNDER : under 10°C NORMAL : 10 to 40°C HIGH : 40 to 60°C OVER : over 60°C

1.13.8 OTHERS

This screen allows the setup menu to be saved temporarily, loaded or initialized.
To execute an item, switch it from "OFF" (displayed as "00") to "ON" (displayed as "01") with the [SELECT] button, then press the [DATA SET] button (excluding hour meter). As switching an item "ON" switches other items automatically "OFF", it is not possible to execute more than one item simultaneously.

Item	Counter Display	Factory Default	Description
MEMORY SW SAVE	5Π 00	OFF	Saves the data set with the setup menu.
MEMORY SW LOAD	LΠ 00	OFF	Loads the data set for the setup menu.
MEMORY SW INITIALIZE	Πı 00	OFF	Initializes the setup menu data to the factory defaults.
ERROR HISTORY CLEAR	Ec 00	OFF	Clears the error history.
LCD/KEY TEST	Lcd 00	OFF	Checks the lighting of operation key LEDs. After changing the setting to "START", press the [DATA SET] button. The viewfinder screen and LCD display show "PERFORM" and the key test mode is set. In this mode pressing an operation key, lights the corresponding LED but does not cause the VCR to operate. To exit from the key test mode, change the setting to "STOP" and press the [DATA SET] button. The viewfinder screen and LCD shows "PERFORM" and the normal mode is reset.
DRUM H.M. CLEAR	dHc 00	OFF	Resets the drum hour meter.
CAP H.M. CLEAR	cHc 00	OFF	Resets the capstan hour meter.
LOADING TIMES CLEAR	L7c 00	OFF	Resets the loading count.
EJECT TIMES CLEAR	E7c 00	OFF	Resets the ejection count.
H. CLEAN TIMES CLEAR	H7c 00	OFF	Resets the head cleaning count.
FWD/REV TIMES CLEAR	F7c 00	OFF	Resets the forward/reverse operation count

1.14 ALARM DETECTION METHODS

The unit incorporates the alarm display function, which notifies the user of the VCR status, remaining tape and remaining battery power. For the contents of the alarm display, see page 86 of the instruction manual. This section describes the methods applied for alarm detection.

Item	Description	Status After Detection	Detection Method
Servo lock error "SERVO" (Counter display) SYnc inh	When the drum rotation phase is deviated by more than 10 or when the capstan motor rotation speed is deviated by more than 20%.The alarm sound is generated in REC mode. The alarm display only appears in the PLAY mode. When external sync input signal SYNC IN is disturbed, "SYnc inh" (sync inhbit) is displayed.	Same mode is maintained.	The MSD microcomputer detects the drum rotation phase from the phase error between the TSR and HID signals. The capstan motor rotation speed is detected based on the CAP FG signal.
Head clog "RF" (Counter display) HEadCLo9	Measures the error rate during playback or quick review with RET button and displays "HEAD CLOG" when the viterbi is ON and exceeds 2000 (total).	Same mode is maintained.	—
Dew condensation "DEW"	When dew warning occurs with the VCR.	See error code "0201 DEW" in 1.16.	
Lithium battery exhaustion "Li"	When the built-in lithium battery for the timecode backup is exhausted or not installed.	Same mode is maintained.	Decrease in the battery voltage below 2.6 V.
Remaining battery	When the remaining battery power is low.	• Battery nearly empty: Operation is maintained. • Battery empty: Operation stops automatically.	Detects the voltage at system controller pin 62.

1.15 BATTERY POWER DETECTION METHODS

The battery voltage is detected to display the remaining power on the LCD. Since the detection voltage is variable depending on the 12 V/13.2 V/14.4 V battery types, correct settings should be made with the setup menu.

Detection voltage and remaining battery display

Display	Battery Type		
	12V	13.2V	14.4V
E BATT F ■ ■ ■ ■ ■ ■ ■	12.6V –	3.8V –	15.1V –
E BATT F ■ ■ ■ ■ ■ ■ □ ("F" off)	12.0V – 12.5V	13.2V – 13.8V	14.4V – 15.0V
E BATT F ■ ■ ■ ■ ■ □ □ ("F" off)	11.8V – 11.9V	13.0V – 13.1V	14.2V – 14.3V
E BATT F ■ ■ ■ ■ □ □ □ ("F" off)	11.6V – 11.7V	12.8V – 12.9V	13.9V – 14.1V
E BATT F ■ ■ ■ □ □ □ □ ("F" off)	11.3V – 11.5V	12.4V – 12.7V	13.6V – 13.8V
E BATT F ■ ■ □ □ □ □ □ ("F" off)	11.2V	12.3V	13.4V – 13.5V
E BATT F ■ ■ □ □ □ □ □ ("F" off, "BATT" blinking) (Segment blinking)	11.0V – 11.1V	11.6V – 12.2V	12.6V – 13.3V
E BATT F ■ □ □ □ □ □ □ ("F" off, "BATT" blinking) (Segment blinking)	10.6V – 10.9V	10.6V – 11.5V	10.6V – 12.5V
E BATT F □ □ □ □ □ □ □ ("F" off, "BATT" blinking) (Segments off)	– 10.5V	– 10.5V	– 10.5V

1.16 WARNING CODES

If a problem occurs during operation, the unit diagnoses the cause by itself, provides a warning through the "warning LED" and "buzzer", and displays the diagnosis results in the counter display.

[LCD counter]
Error display appears. (**** is the error code.)
Err-****
[Warning LED]
The red LED blinks (at about 4 Hz).

[Buzzer]
Generates a continuous tone. However, the tone is intermittent (at about 4 Hz) in case of dew alarm.

0201 Condensation

- VCR operation
  In save mode:
  - If a cassette is loaded, enters the AUTO OFF mode.
  - If a cassette is not loaded, the warning LED lights and the SAVE mode is maintained.

  In other modes:
  - If a cassette is loaded, the AUTO OFF mode is initiated.
  - If a cassette is not loaded, the warning LED lights and the drum rotates. An operation is accepted after any condensation has evaporated.
- Cause : Condensation of moisture.
- Detection method : Check the voltage at the pin 124 of IC401.
  DEW ON : 2.4 V or more
  DEW OFF : 1.8 V or less

0601 WRONG CASSETTE TYPE

- VCR operation : The AUTO OFF mode is initiated.
- Cause : A wrong type of cassette for the computer is inserted.
- Detection method : An error in the cassette type is detected (at pins 117, 118 and 119 of IC401) after the insertion is completed.

3200 LOADING INCOMPLETE

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Malfunction of the loading motor, rotary encoder or mechanism.
- Detection method : The rotary encoder output is checked (at pins 44, 45 and 46 of IC401) and an error is detected when loading has not completed in 4 seconds.

3300 UNLOADING INCOMPLETE

- VCR operation : After the first unloading error, the cassette is loaded temporarily, then unloading is retried. If the retry fails again, the AUTO OFF mode is initiated.
- Cause : Malfunction of the loading motor, rotary encoder or mechanism.
- Detection method : The rotary encoder output is checked (at pins 44, 45 and 46 of IC401) and an error is detected when unloading has not completed in 4 seconds.

4000 INTAKE INCOMPLETE

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Malfunction of the cassette housing switch or cassette housing motor.
- Detection method : When completion of insertion is not detected (at pin 27 of IC401) within 3 seconds after the start.

4100 EJECTION INCOMPLETE

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Malfunction of the cassette housing switch or cassette housing motor.
- Detection method : When completion of ejection is not detected (at pin 27 of IC401) within 3 seconds after the start.

5605 TAPE BEGIN/END DETECTED SIMULTANEOUSLY

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Tape is cut due to abnormal tension or a mechanism defect or because the cassette was inserted while the tape was slack.
- Detection method : When both the tape begin sensor (at pin 126 of IC401) and the tape end sensor (at pin 125 of IC401) output Low level together when a cassette is loaded.

5606 SP REEL RUNAWAY DURING UNLOADING

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Tape is cut due to abnormal tension or a mechanism defect or because the cassette was inserted while the tape was slack.
- Detection method : When the detected TU reel rotation count (at pin 59 of IC401) exceeds 30 revs. per sec. (1200 pulses) during unloading.

5607 TU/SUP REEL STOPPED DUE TO A CUT TAPE

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Tape is cut due to abnormal tension or a mechanism defect or because the cassette was inserted while the tape was slack.
- Detection method : When the FGs from the SUP and TU reels were not detected at all (at pins 59 and 60 of IC401) during loading.

5702 TAPE END DETECTED AFTER SHORT REW

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Tape is cut after the end of the tape has been detected. The mode transition of the mechanism failed.
- Detection method : When the tape end sensor output (at pin 125 of IC401) remains Low even after 3 seconds have elapsed since the start of the short REW operation following the tape end detection in play mode, etc.

5802 TAPE BEGIN DETECTED AFTER SHORT FF

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Tape is cut after the end of the tape has been detected. The mode transition of the mechanism failed.
- Detection method : When the tape begin sensor output (at pin 126 of IC401) remains Low even after 3 seconds have elapsed since the start of the short FF operation following the tape beginning detection in the reverse search mode, etc.

7001 DRUM MOTOR ROTATION ERROR

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Malfunction of the drum motor, MDA circuit or FG detector circuit.
- Detection method : When the drum FG has not been detected (at pin 54 of IC401) for more than 4 seconds in the drum driving mode.

7101 CAPSTAN MOTOR ROTATION ERROR

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Malfunction of the capstan motor, MDA circuit or FG detector circuit.
- Detection method : When the drum FG has not been detected (at pin 55 of IC401) for more than 2 seconds in the capstan driving mode.

7202 SUP TAPE SLACK DURING CAPSTAN DRIVE

- VCR operation : The AUTO OFF mode is initiated.
- Cause : The timing belt is cut or one of the reel control parts in the mechanism is malfunctioning.
- Detection method : When the SUP reel FG has not been detected (at pin 60 of IC401) during 5 rotations of the capstan in the capstan driving mode.

7302 TU TAPE SLACK DURING CAPSTAN DRIVE

- VCR operation : The AUTO OFF mode is initiated.
- Cause : The timing belt is cut or one of the reel control parts in the mechanism is malfunctioning.
- Detection method : When the TU reel FG has not been detected (at pin 59 of IC401) during 5 rotations of the capstan in the capstan driving mode.

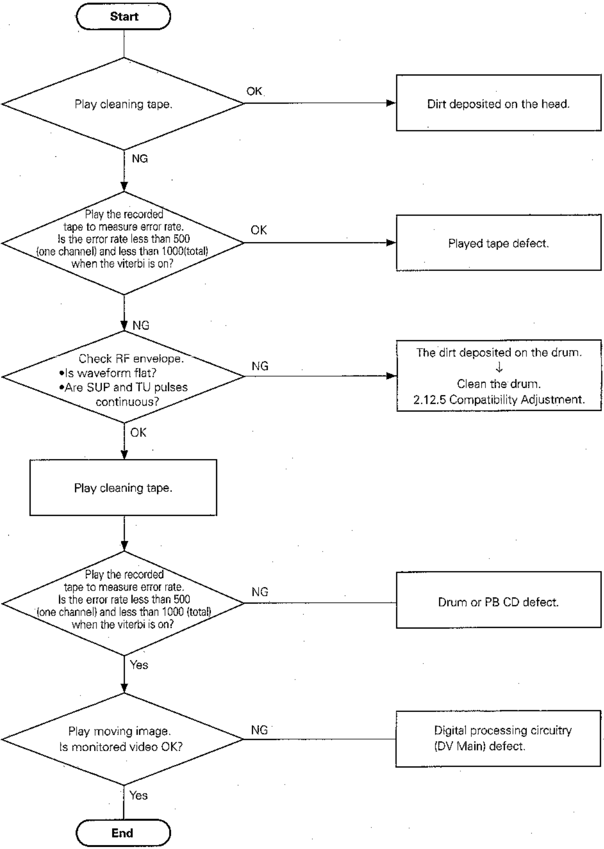
7305 NO TU REEL ROTATION DURING UNLOADING

- VCR operation : The AUTO OFF mode is initiated.
- Cause : Malfunction of the cassette housing switch or cassette housing motor.
- Detection method : When the TU reel rotation detected (at pin 59 of IC401) during unloading is less than 1/2 turn.

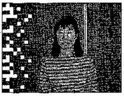
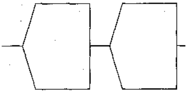
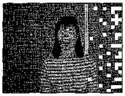
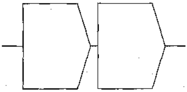
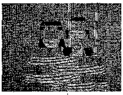
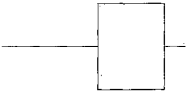
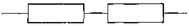
1.17 ANALYSIS OF BLOCK NOISE (SYMPTOMS: POOR VIDEO, ABSCNCE OF AUDIO)

1.17.1 Analysis Flow Chart

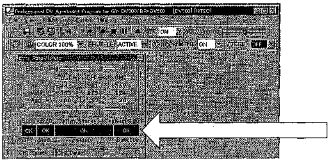
In case of trouble, perform troubleshooting using the following flow chart.


Start
Play cleaning tape.
OK
Dirt deposited on the head.
NG
Play the recorded tape to measure error rate. Is the error rate less than 500 (one channel) and less than 1000(total) when the viterbi is on?
OK
Played tape defect.
NG
Check RF envelope.
•Is waveform flat?
•Are SUP and TU pulses continuous?
NG
The dirt deposited on the drum.
↓
Clean the drum.
2.12.5 Compatibility Adjustment.
OK
Play cleaning tape.
Play the recorded tape to measure error rate. Is the error rate less than 500 (one channel) and less than 1000 (total) when the viterbi is on?
NG
Drum or PB CD defect.
Yes
Play moving image.
Is monitored video OK?
NG
Digital processing circuitry (DV Main) defect.
Yes
End

1.17.2 RF Envelope Check

Symptom Observed on Monitor Screen	RF envelope	Audio, etc.	Possible Causes
Block noise on left 	SUP dropout 	• No audio output. • Intermittent audio.	• Supply guide roller adjustment failure. • Dirt on supply side of drum.
Block noise on right 	TU dropout 	• Timecode not counted.	• Take-up guide roller adjustment failure. • Dirt on take-up side of drum.
One CH frozen 	No video output from one CH 	• Audio is output.	• Dirt attached on one CH of head. • Drum assembly defective. • PR & MDA board IC901 defective.
Frozen 	Low level 	• No audio output.	• Dirt attached on head. • Drum assembly defective.

The RF envelope condition can be confirmed to a certain degree in the Error Rate adjustment display.



SECTION 2
MECHANICAL ADJUSTMENTS

2.1 BERORE ADJUSTMENTS

2.1.1 Precautions

1) Be sure to apply a screw securing torque when attaching a part.
   The securing torque should be 0.04 N-m (0.4 kgf-cm) unless otherwise specified.
2) Always unplug the power cord of the set before attaching, removing or soldering a part.
3) When unplugging a connector, do not pull the wire but grasp the connector body.
4) Do not make an adjustment or rotate a potentiometer blindly while the source of trouble is not identified.
5) Before adjusting electrical circuitry, be sure to wait for more than 10 minutes after turning the power on.

2.1.2 Measuring instruments required for adjustments

Instrument	Condition
Oscilloscope	Calibrated instrument with measuring bandwidth of 100 MHz or more.
Personal computer	Microsoft Windows 95 environment, Pentium 133 MHz or better, Memory 16 MB or more.

Table 2-1-1

2.1.3 Equioment required for adjustments

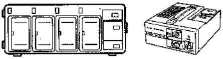
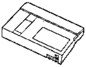
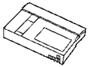
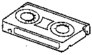
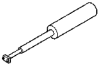
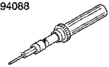
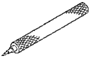
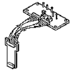
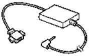
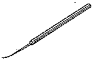
1	DV 12 V power supply(AA-G10/AA-P250)	Output capability of 3 A or more. 
2	Alignment tape	MC-1 (NTSC) MC-2 (PAL) 
3	DV tape	For use in self-recording/playback. (60 ME) 
4	Cassette torque meter	YTU94150A 
5	Guide screwdriver	YTU94085 
6	Torque screwdriver	YTU94088  YTU94088-003 Replaceable bit (long type)
7	Slit washer attaching tool	YTU94121A 
8	Connector cable	PTU94016A 
9	PC cable	QAM0099-001 
10	Adjustment software	PLSC1304
11	Chip IC replacement tool	PTS40844-2 

Table 2-1-2

2.2 BASICS OF MECHANISM DISASSAMBLY/ASSEMBLY

2.2.1 Assembly mode

The disassembly and assembly of the mechanism can be done in the ASSEMBLY mode (see Table 2-2-1).
The ASSEMBLY mode is provided in the intermediate position between C-IN and S.FF. As the C-IN (Cassette IN) mode is usually set when a cassette tape is ejected, the ASSEMBLY mode should be entered after entering the C-IN mode. To set the ASSEMBLY mode, apply 3 V DC to the electrodes at the top of the loading motor shown in Fig. 2-2-1. The ASSEMBLY mode is set when the markings (red) on two gear teeth of the rotary encoder are aligned with the confirmation holes.

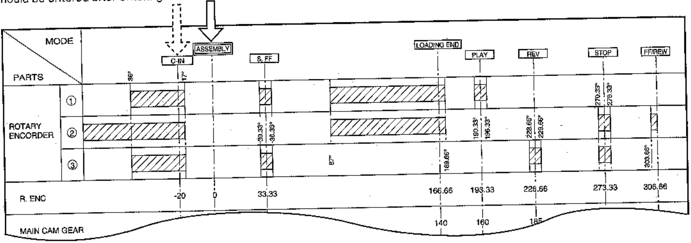


Table 2-2-1

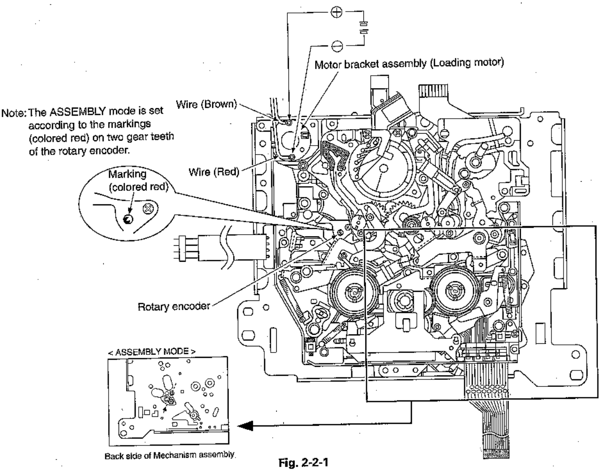

⊕
⊖
Motor bracket assembly (Loading motor)
Note: The ASSEMBLY mode is set according to the markings (colored red) on two gear teeth of the rotary encoder.
Wire (Brown)
Wire (Red)
Marking (colored red)
Rotary encoder
< ASSEMBLY MODE >
Back side of Mechanism assembly

Fig. 2-2-1

2.2.2 Mechanism modes

The mechanism has 6 modes as shown in Table 2-3-1.
The current mode can be confirmed by observing the markings on the sub-cam gear and the ▲ mark on the main deck at the back side of mechanism assembly. See Figs. 2-2-2 to -7.

1. Mechanism mode confimation

<C-IN : Ⓒ>

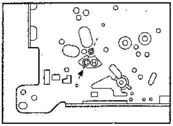


Fig. 2-2-2

<S-FF : Ⓗ>

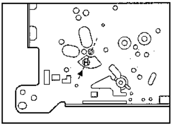


Fig. 2-2-3

<PLAY : Ⓟ>

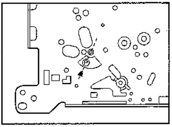


Fig. 2-2-4

<REV : Ⓡ>

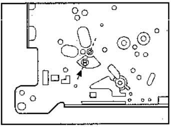


Fig. 2-2-5

<STOP : Ⓢ>

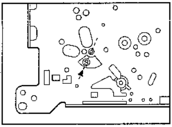


Fig. 2-2-6

<FF/REW : Ⓕ>

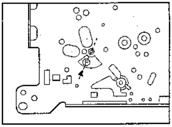


Fig. 2-2-7

2.3 MECHANISM TIMIN CHART

See following table (Table 2-3-1).

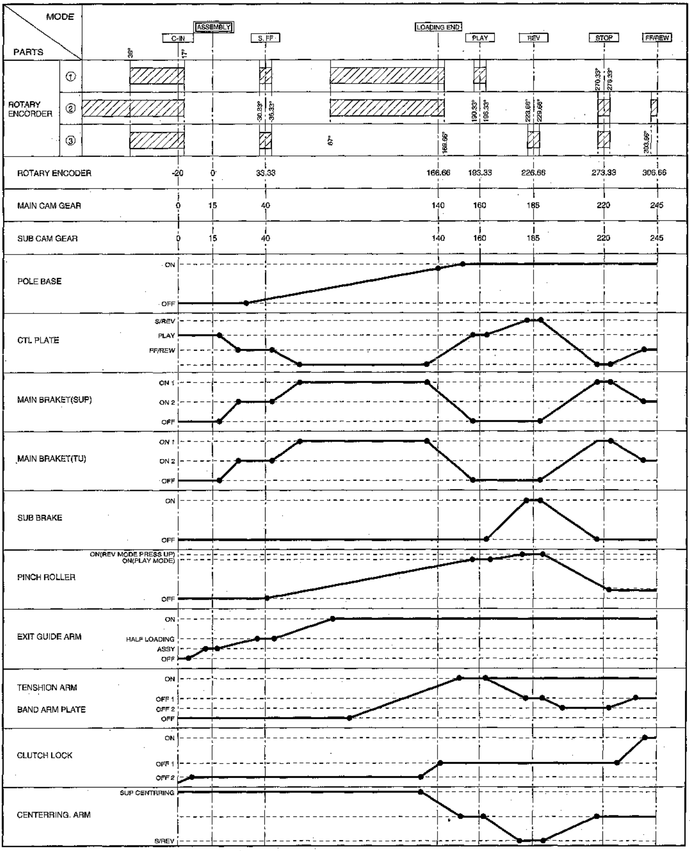


Table 2-3-1

2.4 MAINTENANCE AND INSPECTION OF MAJOR PARTS

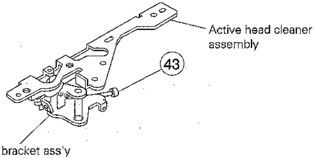
Periodical inspection and maintenance are requisite to maintain the initial performance and reliability of the product. Table 2-4-1 (Maintenance & Inspection List) has been compiled assuming standard operating conditions, and the specifications in the table are greatly variable depending on the actual operating environment and conditions. Remember that, if the maintenance and inspection are not enforced properly, the operating hours of the product will not only reduce considerably but other unfavorable influences may produce.

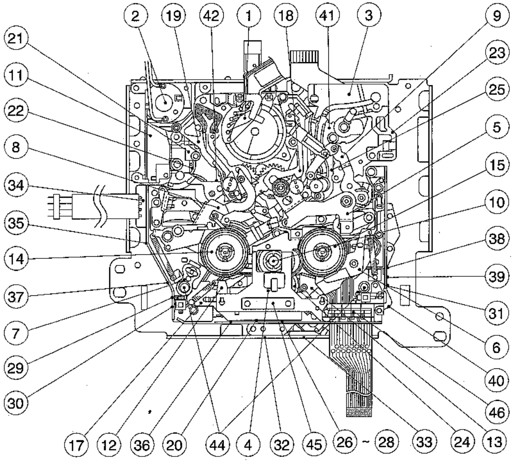
Rubber parts may deform or degrade after long period of storage even if they are not used in this period.

The service life of the drum is variable depending on the tape used and operating environment.

2.4.1 Layout of Major Parts

To attach the Active Head Cleaner Assembly, refer to "1.7.2. Disassembling the Rear Part of the Unit".


Active head cleaner assembly
43
Cleaner bracket ass'y


2
19
42
1
18
41
3
9
21
11
22
8
34
35
14
37
7
29
30
23
25
5
15
10
38
39
31
6
40
46
17
12
36
20
44
4
32
45
26 ~ 28
33
24
13

2.4.2 Maintenance and insoection list

1) The 6000 H maintenance consists of a replacement of the entire mechanism assembly.
2) When mounting the capstan motor on the main deck, control of the verticality is required. Therefore, when the capstan motor reaches the end of its service life, the entire mechanism assembly should be replaced.

	Part Name	Symbol No.	Operating Hours (DRUM Hour Meter)												Ref.
			500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	
1	Tape transport parts		★	★	★	★	★	★	★	★	★	★	★	–	
2	㉑ ENT. guide base assembly	M6 43	★	○★	★	●	★	○★	★	●	★	○★	★	–	2.7.14
3	⑧ Tension arm sub-assembly	M6 40	★	○★	★	●	★	○★	★	●	★	○★	★	–	2.7.8
4	⑲ Guide rail (S) assembly	M6 22	★	○★	★	●	★	○★	★	●	★	○★	★	–	2.7.12
5	⑮ Guide rail (T) assembly	M6 23	★	○★	★	●	★	○★	★	●	★	○★	★	–	2.7.12
6	③ Middle catcher assembly	M6 24	★	○★	★	●	★	○★	★	●	★	○★	★	–	2.7.5
7	⑦ Capstan shaft	M6 4	★	★	★	★	★	★	★	★	★	★	★	–	
8	⑤ Pin roller arm assembly	M6 44	★	○★	★	●	★	○★	★	●	★	○★	★	–	2.7.3
9	⑨ Exit guide arm assembly	M6 43	★	○★	★	●	★	○★	★	●	★	○★	★	–	2.7.4
10	① Drum assembly	M6 50	★	★	★	●	★	★	★	●	★	★	★	–	2.7.2
11	㊶ Capstan motor	M6 4	–	–	–	–	–	○	○	○	○	○	○	●	–
12	㉖ Reel drive pulley assembly	M6 33	–	○△	–	●△	–	○△	–	●△	–	○△	–	–	2.7.15
13	㉔ Center gear assembly	M6 34	○	●△	○	●△	○	●△	○	●△	○	●△	○	–	2.7.14
14	㉓ Timing belt	M6 11	○	●	○	●	○	●	○	●	○	●	○	–	2.7.14
15	㉘ Clutch lock gear (1) ㉗ Clutch lock gear (2)	M6 12 M6 14	–	○△	–	●△	–	○△	–	●△	–	○△	–	–	2.7.15
16	⑥ Sub-brake assembly	M6 36	–	○	–	●	–	○	–	●	–	○	–	–	2.7.10
17	⑫ Main brake (S) assembly	M6 38	–	○	–	○	–	○	–	○	–	○	–	–	2.7.10
18	⑬ Main brake (T) assembly	M6 37	–	○	–	●	–	○	–	●	–	○	–	–	2.7.10
19	⑭ 15Reel disk assemblies	M6 39	–	○	–	●△	–	○	–	●△	–	○	–	–	2.7.11
20	⑦ Band arm plate assembly	M6 41	–	○	–	●	–	○	–	●	–	○	–	–	2.7.8
21	⑩ Swing arm assembly	M6 42	○	●	○	●	○	●	○	●	○	●	○	–	2.7.7
22	㉒ Worm wheel 2	M6 3	–	○	–	●	–	○	–	●	–	○	–	–	2.7.14
23	② Motor bracket assembly	M6 20	–	○	–	●	–	○	–	●	–	○	–	–	2.7.2
24	㉞ Rotary encoder assembly	M6 21	–	○	–	●	–	○	–	●	–	○	–	–	2.7.18
25	㊲ Centering arm assembly	M6 26	–	○	–	●	–	○	–	●	–	○	–	–	2.7.18
26	㉟ Min cam	M6 8	–	○	–	●	–	○	–	●	–	○	–	–	2.7.18
27	㊳ Sub cam	M6 9	–	○	–	●	–	○	–	●	–	○	–	–	2.7.19
28	㊸ Cleaner assembly	M5 29	○	●	○	●	○	●	○	●	○	●	○	●	2.7.20
29	㊹ Cassette guide pin	M6 35	★	★	★	★	★	★	★	★	★	★	★	–	
30	㊺ Cassette guide	M6 35	★	★	★	★	★	★	★	★	★	★	★	–	
31	㊻ MIC contact	M6 35	★	★	★	★	★	★	★	★	★	★	★	–	
32	Mechanism assembly (including cassette housing assembly)	M6 1	–	–	–	–	–	–	–	–	–	–	–	●	

★: Clean with ethanol. ○: Check and replace if required. ●: Replace. △: Oil the shaft.
After replacing a part, apply lubricant to the required points.

Table 2-4-1

2.4.3 Cleaning

The tape transport system should be cleaned periodically. Be sure to clean the tape transport system upon receipt of a set for servicing, etc. To clean use a good quality fine-textured cloth moistened with ethyl alcohol.

1) When the video head is stained, the playback output decreases and a read error will not be able to be corrected by the error correction. If this occurs, the video will be interfered by block noise, the audio will not be output, and the video output will eventually be lost when the video head becomes extremely dirty. To clean the drum, while applying cleaning cloth (service part No. : KSMM-01) or high quality paper gently to the upper drum, rotate the upper drum in the normal (counterclockwise) rotation direction.
   The dirt deposited on the video head can be removed by playing a cleaning tape.

CAUTION

Do not move the cleaning paper while applying it to the video head. Otherwise, the video head may be damaged.

2) The lower drum tends to attract dirt on the leader section and the linearity cannot be guaranteed when the lower drum becomes extremely dirty. Particularly, the tape inlet and output sections gather dirt easily, causing symptoms such as dropout of the reproduced FM signal, deterioration of video quality and lack of audio output. In order to clean the leader section, rub a a cotton swab gently along its edge.

3) Stain of the tape transport system leads to tape damage. When magnetic powder or dirt penetrates inside the rollers, a rotation malfunction may affect the video. Clean the tape transport parts carefully using a cleaning cloth or cotton swab moistened with ethyl alcohol.

2.4.4 Oiling and Greasing

Table 2-4-2 shows the oil and greases used with the set.

Classification	Name	Part No.
Oil	Cosmo Hydro HV100	YTU94027
Grease	Maltemp SH-P	KYODO-SH-P
	Hanal	RX-410R

Table 2-4-2

1) Oiling should be performed periodically. Oil the shafts by referring to the maintenance table.
2) After replacing a part, grease the required points. For the parts to be greased see the exploded diagram in chapter 5, "DISASSEMBLY DRAWINGS AND PARTS LIST".
3) As Hanal separates over time, be sure to mix it (shake) well before use.
4) Take care not to leave grease or oil on the tape transport parts which come into contact with the tape or on the brake pads.
5) Take care not to apply too much oil or grease. The standard oiling quantity is one drop and the standard greasing quantity is the quantity with which the grease does not overflow.

2.5 PERIODICAL MAINTENANCE

Perform maintenance at the correct times in accordance with the maintenance table.
Fig. 2-5-1 shows the flow chart of periodical maintenance procedures at different operating hours.

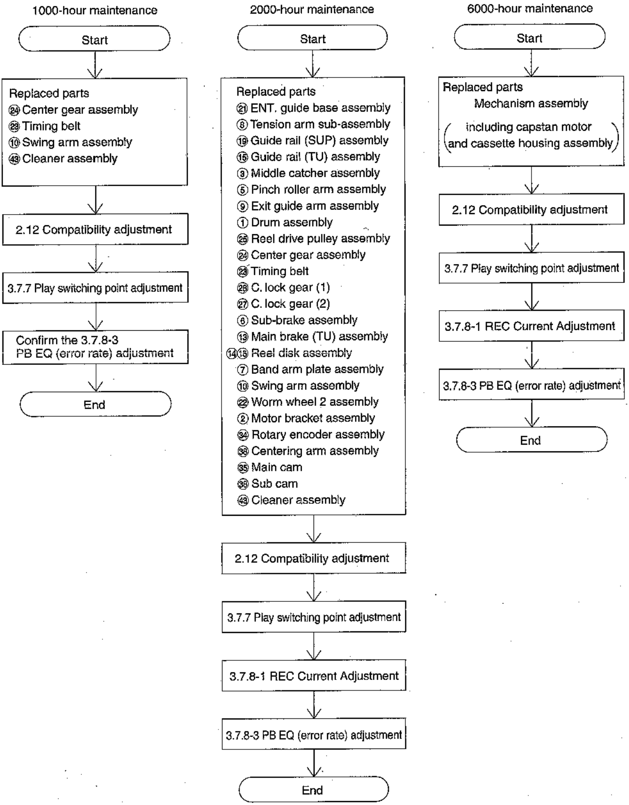

1000-hour maintenance
Start
Replaced parts
㉔ Center gear assembly
㉓ Timing belt
⑩ Swing arm assembly
㊸ Cleaner assembly
2.12 Compatibility adjustment
3.7.7 Play switching point adjustment
Confirm the 3.7.8-3 PB EQ (error rate) adjustment
End
2000-hour maintenance
Start
Replaced parts
㉑ ENT. guide base assembly
⑧ Tension arm sub-assembly
⑲ Guide rail (SUP) assembly
⑮ Guide rail (TU) assembly
③ Middle catcher assembly
⑤ Pinch roller arm assembly
⑨ Exit guide arm assembly
① Drum assembly
㉕ Reel drive pulley assembly
㉔ Center gear assembly
㉓ Timing belt
㉘ C. lock gear (1)
㉗ C. lock gear (2)
⑥ Sub-brake assembly
⑬ Main brake (TU) assembly
⑭⑯ Reel disk assembly
⑦ Band arm plate assembly
⑩ Swing arm assembly
㉒ Worm wheel 2 assembly
② Motor bracket assembly
㉞ Rotary encoder assembly
㊳ Centering arm assembly
㉟ Main cam
㊱ Sub cam
㊸ Cleaner assembly
2.12 Compatibility adjustment
3.7.7 Play switching point adjustment
3.7.8-1 REC Current Adjustment
3.7.8-3 PB EQ (error rate) adjustment
End
6000-hour maintenance
Start
Replaced parts
Mechanism assembly
(including capstan motor and cassette housing assembly)
2.12 Compatibility adjustment
3.7.7 Play switching point adjustment
3.7.8-1 REC Current Adjustment
3.7.8-3 PB EQ (error rate) adjustment
End

Fig. 2-5-1

2.6 DISASSEMBLY/ASSEMBLY OF MECHANISM ASSEMBLY

2.6.1 Assembly/Disassembly

The following table shows the mechanism assembly/disassembly procedures.

① : Names of the disassembled/assembled parts.
② : Items of disassembly.
③ : Parts to be removed for disassembly, such as screws, washers and springs, and points.

Symbol	Name or Point
S	Screw
W	Washer
P	Spring
*	Connector, lock (L), soldering (SD), shield, etc.

2.6.2 Screws and Washers Used in Mechanism Assembly Disassembly/Assembly

Table 2-6-1 shows the symbols, designs, part numbers and colors of the screws and washers used with the Mechanism assembly.
When disassembling or assembling the Mechanism assembly, be sure to attach the correct screws and washers by referring to the following table.

Symbol	Design	Part No.	Color
(S1)		QYSDSP2005Z	Gold
(S2)		YQ43893	Silver
(S3)		YQ43893-7	Black

Symbol	Design	Part No.	Color
W1		YQ44246	Red
W2		YQ44246-3	Black
W3		YQ43933-2	Black

Fig. 2-6-1

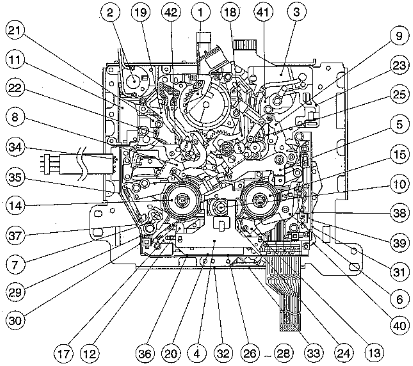
	Part Name	Step	Points	Remark
1	Ⓐ Cassette housing assembly, Ⓑ Main deck assembly	1	2(S1), (L1) to (L5)	
2	① Drum assembly	2	3(S2)	
3	② Motor bracket assembly	2	4(S2)	
4	③ Middle catcher assembly	3	3(S2)	

↑ ↑ ↑
① ② ③

2.6.3 Mechanism Assembly Disassembly Procedure Table

	Part Name	Item	Points	Remark
1	Ⓐ Cassette housing assembly	1	2 (S1), (L1) to (L5)	
2	① Drum assembly	2	3 (S2)	
3	② Motor bracket assembly	2	4 (S2)	
4	③ Middle catcher assembly	5	3 (S2)	
5	④ Reel cover assembly	6	(S2), 2 (L6)	
6	⑤ Pinch roller arm assembly	3	(W1), (L7)	
7	⑥ Sub-brake assembly	10	(P1), (W1), (L8)	
8	⑦ Band arm plate assembly	8	(S3), (L9), (P2), (W2)	
9	⑧ Tension arm sub-assembly	8	(P3)	
10	⑨ Exit guide arm assembly	4	(W1)	
11	⑩ Swing arm assembly	7	–	Position alignment
12	⑪ Sub-deck assembly	9	4 (S2)	Position alignment
13	⑫ Main brake (SUP) assembly	10	(P4), (L10)	
14	⑬ Main brake (TU) assembly	10	(P5), (L11)	
15	⑭ Reel base assembly (SUP)	11	–	
16	⑮ Reel base assembly (TU)	11	–	
17	⑯ Prism	7	(S2)	
18	⑰ Control plate	11	(2 (L12)	
19	⑱ Guide rail (TU) assembly	12	4 (S2)	Position alignment
20	⑲ Guide rail (SUP) assembly	12	(S2), 2 (L13)	Position alignment
21	⑳ Base plate assembly	13	(S2), 2 (L14)	
22	㉑ ENT. guide base assembly	14	(S2)	
23	㉒ Worm wheel 2	14	–	Phase alignment
24	㉓ Timing belt	14	–	
25	㉔ Center gear assembly	14	–	
26	㉕ Reel drive pulley assembly	15	(W1)	
27	㉖ Push plate	15	(W1)	
28	㉗ Clutch lock gear (2)	15	(W3)	
29	㉘ Clutch lock gear (1)	15	(P6)	
30	㉙ Tension control arm assembly	16	(L15)	Position alignment
31	㉚ Brake control arm assembly	16	(W1), (L16)	Position alignment
32	㉛ Charge arm assembly	16	(L17)	Position alignment
33	㉜ Connect gear 2 (SUP)	17	(S2)	(Phase alignment)
34	㉝ Connect gear 2 (TU)	17	(S2)	(Phase alignment)
35	㉞ Rotary encoder assembly	18	2 (S2)	Phase alignment
36	㉟ Main cam	18	(W1)	Phase alignment
37	㊱ Arm gear 1 assembly	18	Collar	Position alignment
38	㊲ Centering arm assembly	18	(L18)	Position alignment
39	㊳ Sub cam	19	(S2)	Phase alignment
40	㊴ Arm gear 2 assembly	19	–	Position alignment
41	㊵ Clutch lock lever assembly	19	(L19)	Position alignment
42	㊶ Capstan motor			Change with mechanism assembly
43	㊷ Drum base deck		3 (S2)	

Table 2-6-2


②
⑲
㊷
①
⑱
㊶
③
㉑
⑪
㉒
⑧
㉞
㉟
⑭
㊲
⑦
㉙
㉚
⑨
㉓
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⑤
⑮
⑩
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㉛
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㊵
⑰
⑫
㊱
⑳
④
㉜
㉖～㉘
㉝
㉔
⑬

Fig. 2-6-1

2.6.4 Mechanism disassembly/assembly procedure chart

<How to read the chart>

- The following chart shows the disassembly/assembly procedures by dividing them into blocks A to I.
- To remove the tension arm sub-assembly which is located in block D; start disassembly from block A. The tension arm sub-assembly can be removed as the fourth operation after the removals of the cassette housing assembly (block A) → reel cover assembly (block B) → band arm plate assembly (block C).
- The parts enclosed in thick frames are the maintenance parts listed in the maintenance table.
- For details on the disassembly/assembly, see section 2.7, "Replacement of Major Parts".

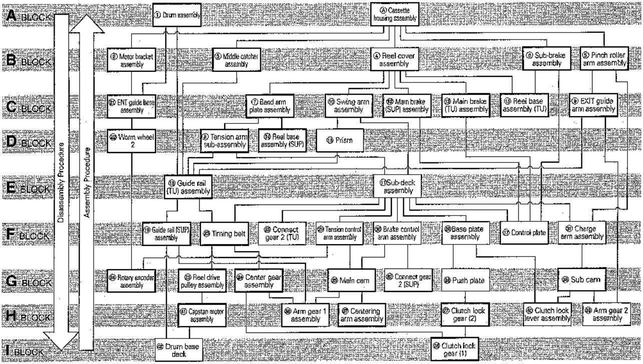
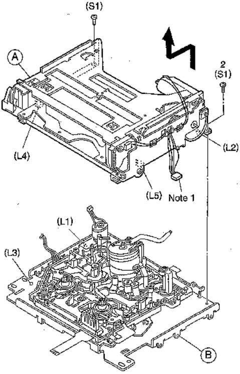
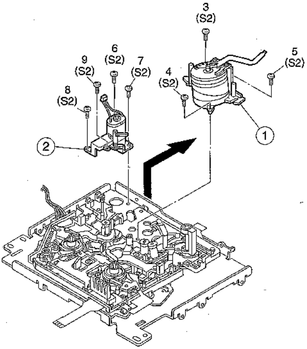

A BLOCK
B BLOCK
C BLOCK
D BLOCK
E BLOCK
F BLOCK
G BLOCK
H BLOCK
I BLOCK
Disassembly Procedure
Assembly Procedure
① Drum assembly
Ⓐ Cassette housing assembly
② Motor bracket assembly
③ Middle catcher assembly
④ Reel cover assembly
⑥ Sub-brake assembly
⑤ Pinch roller arm assembly
㉑ ENT guide base assembly
⑦ Band arm plate assembly
⑩ Swing arm assembly
⑫ Main brake (SUP) assembly
⑬ Main brake (TU) assembly
⑮ Reel base assembly (TU)
⑨ EXIT guide arm assembly
㉒ Worm wheel 2
⑧ Tension arm sub-assembly
⑭ Reel base assembly (SUP)
⑯ Prism
⑱ Guide rail (TU) assembly
⑪ Sub-deck assembly
⑲ Guide rail (SUP) assembly
㉓ Timing belt
㉝ Connect gear 2 (TU)
㉙ Tension control arm assembly
㉚ Brake control arm assembly
⑳ Base plate assembly
⑰ Control plate
㉛ Charge arm assembly
㉞ Rotary encoder assembly
㉕ Reel drive pulley assembly
㉔ Center gear assembly
㉟ Main cam
㉜ Connect gear 2 (SUP)
㉖ Push plate
㊳ Sub cam
㊶ Capstan motor assembly
㊱ Arm gear 1 assembly
㊲ Centering arm assembly
㉗ Clutch lock gear (2)
㊵ Clutch lock lever assembly
㊴ Arm gear 2 assembly
㊷ Drum base deck
㉘ Clutch lock gear (1)

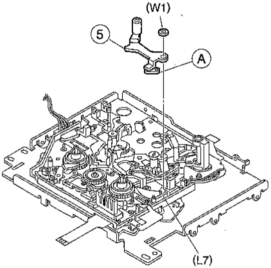
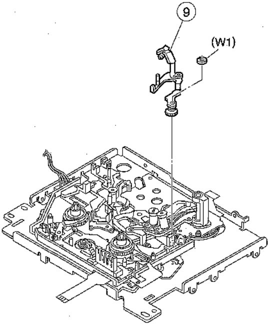
Fig. 2-6-2

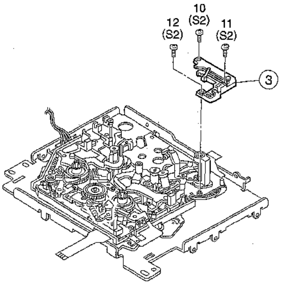
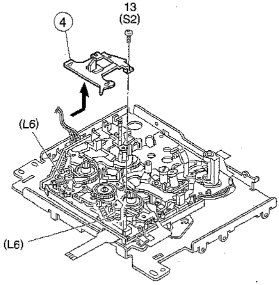
No.	Item	Reference picture/drawing	Procedure

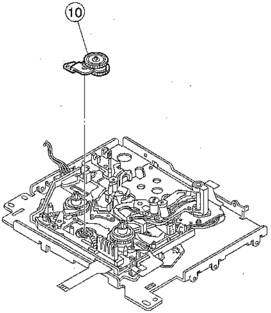
2.7 REPLACEMENT OF MAJOR PARTS

- Make sure that the mechanism is in the ASSEMBLY mode before proceeding to disassembly or assembly. (See section 2.1, "Assembly Mode".)
- Screws must always be tightened using a torque screwdriver and at the specified torque.

1	Ⓐ Cassette housing assembly  1 (S1) 2 (S1) Ⓐ (L4) (L2) (L5) Note 1 (L1) (L3) Ⓑ Fig. 2-7-1	**<Removal>** 1) Remove the 2 screws (S1) then take out the cassette housing by sliding it upward and toward the front. **<Attaching>** 1) Reverse the removal procedure.
2	① Drum assembly, ② Motor bracket assembly  3 (S2) 6 (S2) 9 (S2) 7 (S2) 4 (S2) 5 (S2) 8 (S2) ② ① Fig. 2-7-2	**<Removal>** ① Drum assembly 1) Remove the 3 screws (S2) and take out the assembly. ② Motor bracket assembly 1) Remove the 4 screws and take out the motor bracket assembly. **<Attaching>** 1) Reverse the removal procedure

No.	Item	Reference picture/drawing	Procedure
3	⑤ Pinch roller arm assembly	 Fig. 2-7-3	**<Removal>** 1) Remove the washer (W1) and pull out the assembly. **<Attaching>** 1) Fit the pinch roller arm assembly Ⓐ into the boss (L7) of the charge arm assembly. 2) Attach the washer (W1).
4	⑨ Exit guide arm assembly	 Fig. 2-7-4	**<Removal>** 1) Remove the washer (W1) and pull out the assembly. **<Attaching>** 1) Reverse the removal procedure.

No.	Item	Reference picture/drawing	Procedure
5	③ Middle catcher assembly	 Fig. 2-7-5	**<Removal>** 1) Remove the 3 screws (S2) and remove the assembly. **<Attaching>** 1) Reverse the removal procedure.
6	④ Reel cover assembly	 Fig. 2-7-6	**<Removal>** 1) Remove the screw (S2). 2) Slide the assembly toward the drum and lift the assembly up to remove it. **NOTE** · **After having removed the reel cover, take care because the parts located below the reel cover tend to slip out easily.** **<Attaching>** 1) Insert the reel cover into (L6) and attach by reversing the removal procedure.

No.	Item	Reference picture/drawing	Procedure
7	⑩ Swing arm assembly	 **Fig. 2-7-7**	**<Removal>** 1) Pull the assembly upward. **<Attaching>** 1) Reverse the removal procedure.

No.	Item	Reference picture/drawing	Procedure

8 ⑦ Band arm plate assembly, ⑧ Tension arm sub-assembly

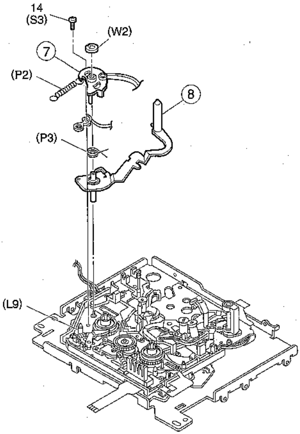

14
(S3)
(W2)
⑦
(P2)
⑧
(P3)
(L9)

Fig. 2-7-8(a)

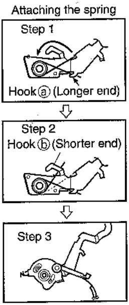

Attaching the spring
Step 1
Hook ⓐ (Longer end)
Step 2
Hook ⓑ (Shorter end)
Step 3

Fig. 2-7-8(b)

<Removal>

1) Remove the washer (W2).
2) Remove the screw (S3).
3) Remove the spring (P2).
4) Remove the band arm plate assembly and tension arm sub-assembly.

NOTE

Be careful not to lose the spring (P3).

<Attaching>

1) Attach the spring (P3) to the tension arm sub-assembly. Engage the longer end of spring to hook ⓐ and the shorter end to hook ⓑ as shown in Fig. 2-7-8(b).
2) Attach the tension arm sub-assembly.
3) Attach the band arm plate assembly.
4) Clamp with the screw (S3) and washer (W2).
5) Attach the spring (P2) to (L9).

NOTE

After attaching, ensure that the band arm assembly can rotate in the direction of the arrow as shown in Fig. 2-7-8(c).

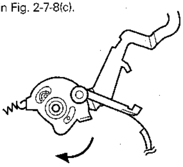
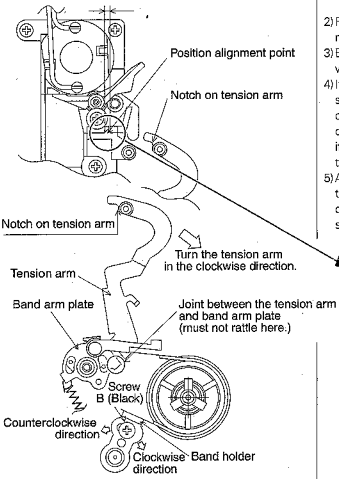


Fig. 2-7-8(c)

6) After attaching, adjust the tension.

No.	Item	Reference picture/drawing	Procedure

8 <Tension arm sub-assembly position adjustment>

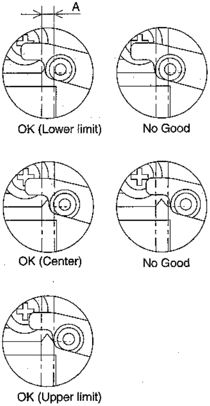


Position alignment point
Notch on tension arm
Notch on tension arm
Turn the tension arm in the clockwise direction.
Tension arm
Band arm plate
Joint between the tension arm and band arm plate (must not rattle here.)
Screw B (Black)
Counterclockwise direction
Clockwise direction
Band holder

Fig. 2-7-8(d)

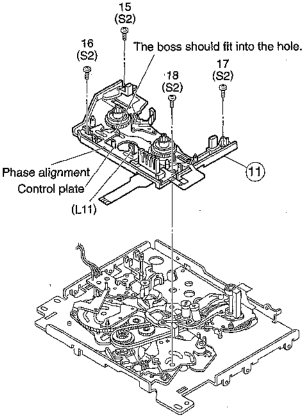
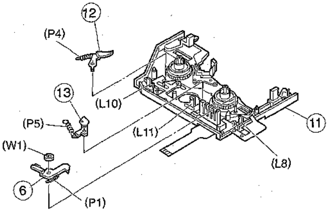
1) Without loading a tape, set the mechanism mode to PLAY mode.
   To switch the mode, rotate worm wheel 2 while the motor bracket assembly is disengaged (see 2.2, "Mechanism Modes").

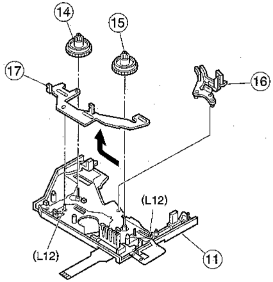
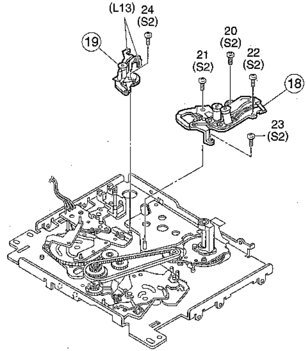
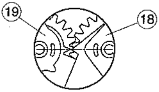
2) Rotate the tension arm slightly clockwise to eliminate production of rattle with the band arm plate.
3) Ensure that the notch on the tension arm is located within area A. (See Fig. 2-7-8(e).)
4) If the tension arm is not located in area A, loosen screw B (black) lightly and fine-adjust the position of the band arm plate assembly. Turn the screw counterclockwise to move the tension arm extremity toward the right or clockwise to move it toward the left.
5) After the adjustment, clamp the band holder by tightening screw B (black) (with a securing torque of 5.88 Nm, or 0.6 kgf-cm). Then adjust the tension arm position again.



A
OK (Lower limit)
No Good
OK (Center)
No Good
OK (Upper limit)

Fig. 2-7-8(e)

No.	Item	Reference picture/drawing	Procedure
9	⑪ Sub-deck assembly	 15 (S2) 16 (S2) The boss should fit into the hole. 17 (S2) 18 (S2) Phase alignment Control plate (L11) ⑪ **Fig. 2-7-9**	**<Removal>** 1) Remove the 4 screws (S2) and pull out the assembly. **<Attaching>** 1) While sliding the control plate toward the left, attach the sub-deck assembly. NOTE · **Attach by aligning the phase holes of the main deck assembly and control plate.** 2) Clamp with 4 screws (S2).
10	⑫ Main brake (SUP) assembly, ⑬ Main brake (TU) assembly, ⑥ Sub-brake assembly	 ⑫ (P4) ⑬ (L10) (P5) (L11) ⑪ (W1) (L8) ⑥ (P1) **Fig. 2-7-10**	**<Removal>** **Main brake (SUP) (TU) assembly** 1) Remove the spring by disengaging its ends from the hooks (L10) (L11). **Sub-brake assembly** 1) Remove the washer (W1). 2) Remove the spring by disengaging it from the hook (L8). **<Attaching>** 1) Reverse the removal procedure.

No.	Item	Reference picture/drawing	Procedure
11	⑭ Reel base (SUP) assembly, ⑮ Reel base (TU) assembly, ⑰ Control plate, ⑯ Prism	 Fig. 2-7-11	**<Removal>** 1) Pull up each assembly to remove it. The control plate can be removed by sliding it toward the left as shown by the arrow. 2) Remove the screw (S2) to remove the prism. **<Attaching>** 1) Reverse the removal procedure.
12	⑱ Guide rail (TU) assembly, ⑲ Guide rail (SUP) assembly	 (L13) 24 (S2) 19 20 (S2) 21 (S2) 22 (S2) 18 23 (S2) Fig. 2-7-12(a)	**<Removal>** **Guide rail (TU) assembly:** 1) Remove the 4 screws (S2) and remove the assembly. **Guide rail (SUP) assembly:** 1) Remove the screw (S2) and remove the assembly. **<Attaching>** 1) Return the guide pole fully to the unloading position, and attach the assemblies by reversing the removal procedures. When attaching, place the alignment markings of the two gears so that they face each other. (See Fig. 2-7-12(b).)  Fig. 2-7-12(b)

No.	Item	Reference picture/drawing	Procedure

13 ⑳ Base plate assembly

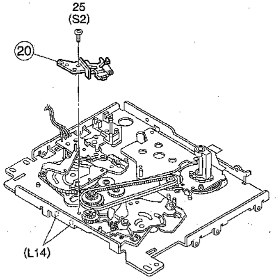


Fig. 2-7-13

<Removal>

1) Remove the screw (S2) and take out the assembly.

<Attaching>

1) Attach the assembly to the boss (L14) as if inserting, then clamp with the screw.

14 ㉑ Entrance guide base assembly, ㉒ Worm wheel 2, ㉓ Timing belt, ㉔ Center gear assembly

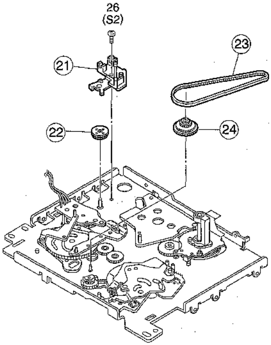


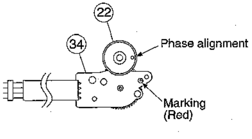
Fig. 2-7-14(a)

<Removal>

1) The entrance guide base assembly can be removed by removing the screw (S2). Other parts can be removed by simply pulling them out.

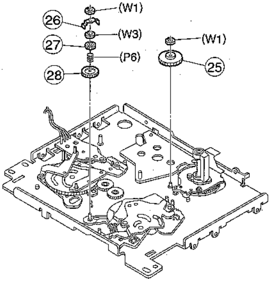
<Attaching>

1) Reverse the removal procedure. See Fig.. 2-7-14(b) for the worm wheel 2.



Align the phase of the rotary encoder assembly ㉞, then attach the main deck assembly by aligning the phase hole with the rotary encoder assembly.

Fig. 2-7-14(b) Attaching Worm Wheel 2 ㉒

No.	Item	Reference picture/drawing	Procedure
15	㉕ Reel drive pulley assembly, ㉖ Push plate, ㉗ Clutch lock gear (1), ㉘ Clutch lock gear (2)	 Fig. 2-7-15	**<Removal>** 1) Remove the washer (W1) and take out the assembly. **<Attaching>** 1) Reverse the removal procedure.

16 ㉙ Tension control arm assembly, ㉚ Brake control arm assembly, ㉛ Charge arm assembly

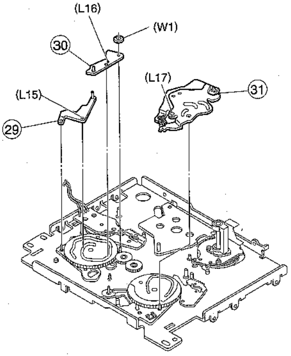
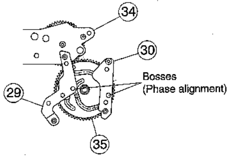

(L16)
(W1)
30
(L17)
31
(L15)
29

Fig. 2-7-16(a)


34
30
Bosses
(Phase alignment)
29
35

Align the phase of the main cam ㉟ then attach by fitting the bosses in the cam groove.

Fig. 2-7-16(b)

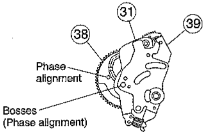
Attaching Tension Control Arm Assembly ㉙ and Brake Control Arm Assembly ㉚

<Removal>

1) The brake control assembly can be removed after removing the washer (W1).

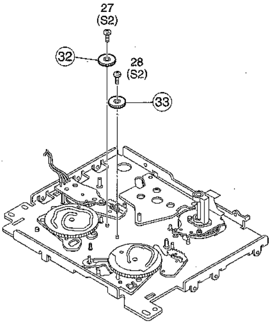
<Attaching>

1) Align the phases of the main cam and sub cam, then attach by reversing the removal procedure. Refer to Fig. 2-7-16(b) and Fig. 2-7-16(c).


31
38
39
Phase alignment
Bosses
(Phase alignment)

Phase alignment
Boss (Phase alignment)
Align the phase of the sub cam ㊳, then attach by fitting the boss into the cam groove.

Fig. 2-7-16(c) **Attaching the Charge Arm Assembly ㉛**

No.	Item	Reference picture/drawing	Procedure
17	㉜ Connect gear 2 (SUP), ㉝ Connect gear 2 (TU)	 Fig. 2-7-17	**<Removal>** 1) Remove the screw (S2) and take out the gears. **<Attaching>** 1) Reverse the removal procedure. The two connect gears 2 are given the same part number. NOTE · **Align the phases of the main cam and sub cam when attaching.**

18 ㉞ Rotary encoder assembly, ㉟ Main cam , ㊱ Arm gear 1 assembly, ㊲ Centering arm assembly

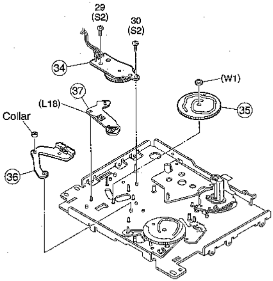
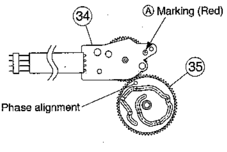

29
(S2)
30
(S2)
㉞
(W1)
㊲
(L18)
Collar
㉟
㊱

Fig. 2-7-18(a)


㉞
Ⓐ Marking (Red)
㉟
Phase alignment

Align the phase of the main cam ㉟, then attach by aligning the red-colored markings Ⓐ (on 2 gear teeth) inside ○.

Fig. 2-7-18(c) Attaching the Rotary Encoder Assembly ㉞

<Removal>

1) The rotary encoder can be removed by removing the 2 screws (S2).
2) The main cam can be removed by removing the washer (W1). As the cam gear is engaged at the rear of the main deck assembly while the phase is aligned, deviate the phase in the direction of the arrow before removal. (See Fig. 2-7-18(b).)

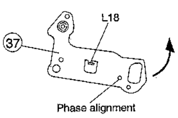
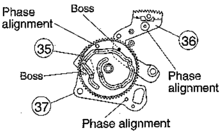

L18
㊲
Phase alignment

Fig. 2-7-18(b) Removing the Centering Arm Assembly ㊲

<Attaching>

1) Align the phase by referring to Figs. 2-7-18(c) and 2-7-18(d), then attach the ass'ies reverse the removal procedure.


Phase alignment
Boss
㊱
㉟
Boss
Phase alignment
㊲
Phase alignment

Align the phases of the arm gear 1 assembly ㊱ and centering arm assembly ㊲, then align those of the arm gear 1 assembly ㊱ and centering arm assembly ㊲, attach the gear by fitting the bosses into the cam groove below, and fit the slit washers.

Fig. 2-7-18(d) Attaching the Main Cam ㉟

No.	Item	Reference picture/drawing	Procedure

19 ㊳ Sub cam ㊴ Arm gear 2 assembly, ㊵ Clutch lock lever assembly

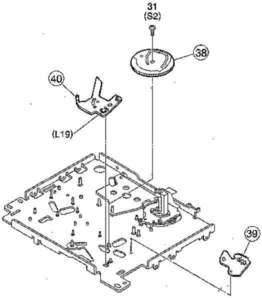

31
(S2)
38
40
(L19)
39

Fig. 2-7-19(a)

<Removal>

1) Remove the screw (S2) and take out the sub cam . As L19 is engaged at the rear of the main deck assembly while the phase is aligned, deviate the phase in the direction of the arrow before removal. 20. This checking should be done after completing the switching point adjustment.

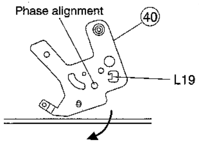
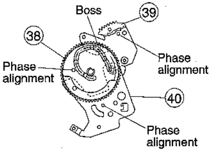

Phase alignment
40
L19

Fig. 2-7-19(b) Removing the Clutch Lock Lever Assembly ㊵

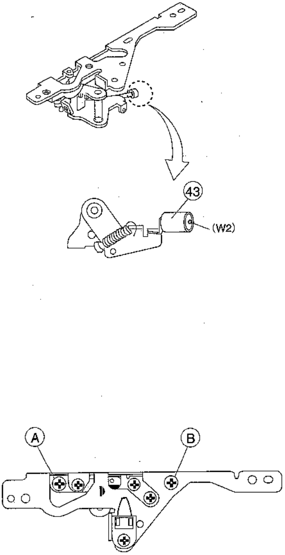
<Attaching>

1) Align the phase correctly by referring to Fig. 2-7-19(c), then attach by reversing the removal procedure.


Boss
39
38
Phase alignment
Phase alignment
40
Phase alignment

Align the phases of the arm gear 2 assembly ㊴ and clutch lock lever assembly ㊵, attach them by fitting the boss into the cam groove below, and clamp with the screw.

Fig. 2-7-19(c) Attaching the Sub Cam ㊳

No.	Item	Reference picture/drawing	Procedure
20	㊸ Cleaner assembly	 Fig. 2-7-18(c)	**<Removal>** 1) Remove the washer (W2) 2) Take out the ㊸ cleaner assembly. **<Attaching>** 1) Reverse the removal procedure. 2) Activate the cleaner (loading) and ensure that the cleaner contacts the drum normally. (Make sure that the cleaner rotation sound is heard.) **<When an active head cleaner assembly is disassembled>** **After the active head cleaner assembly has been disassembled and assembled, the following adjustment is required to restore the pressure of contact of the cleaner to the drum.** 1) Rotate screw Ⓐ fully clockwise until it is stopped, then rotate it counterclockwise by 2.5 turns. (The clamping torque is 4.9×10^{-4} N m/0.5 kgf cm or less) 2) Rotate screw Ⓑ fully clockwise until it is stopped, then rotate it counterclockwise by 0.5 of a turn. (The clamping torque is 4.9×10^{-4} N m/0.5 kgf cm or less) 3) Activate the cleaner (perform loading) and confirm that the contact between the claw, cleaner and drum is normal. (The rotation sound of the cleaner should be audible now.) 4) If the cleaner does not work normally, rotate screw Ⓑ clockwise by 1/8 turn and check the operation again.

2.8 CONFIRMATION AND ADJUSTMENT OF MECHANISM PHASES

See Fig. 2-8-1.

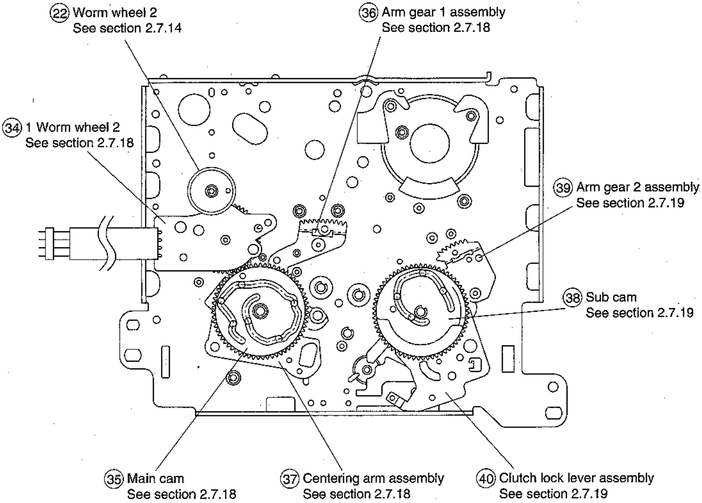
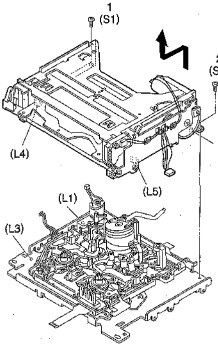

㉒ Worm wheel 2
See section 2.7.14
㊱ Arm gear 1 assembly
See section 2.7.18
㉞ 1 Worm wheel 2
See section 2.7.18
㊴ Arm gear 2 assembly
See section 2.7.19
㊳ Sub cam
See section 2.7.19
㉟ Main cam
See section 2.7.18
㊲ Centering arm assembly
See section 2.7.18
㊵ Clutch lock lever assembly
See section 2.7.19

Fig. 2-8-1

2.9 MECHANISM DISASSEMBLY/ASSEMBLY SHEET

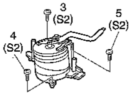
Screw Management																		
Drawing No.	Ⓐ		①			②				③			④	⑦	⑪			
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Table	S1	S1	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S3	S2	S2	S2	S2
Application																		
Ref. No.	No.1		No.2							No.5				No.8	No.9			

Ⓐ Cassette housing assembly


1
(S1)
2
(S1)
(L2)
(L4)
(L5)
(L1)
(L3)

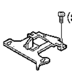
S×12,L1-L5

① Drum assembly



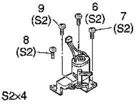
S2×3

④ Reel cover assembly



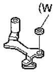
S2,L6×2

② Motor bracket assembly


9
(S2)
6
(S2)
7
(S2)
8
(S2)

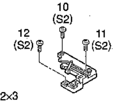
S2×4

⑤ Pinch roller arm assembly



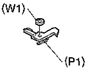
W1,7

③ Middle catcher assembly


10
(S2)
12
(S2)
11
(S2)

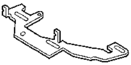
S2×3

⑥ Sub-brake assembly



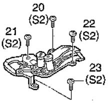
P1,W1,L8

⑰ Control plate



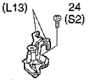
L12×2

⑱ Guide rail (TU) assembly


20
(S2)
21
(S2)
22
(S2)
23
(S2)

S2×4

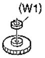
⑲ Guide rail (SUP) assembly



S2,L13×2

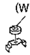
㉔ Center gear assembly

㉕ Reel drive pulley assembly



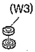
W1

㉖ Push plate

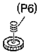


W1

㉗ Clutch lock gear (2)

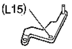


㉘ Clutch lock gear (1)

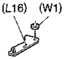


P6

㉙ Tension control arm assembly

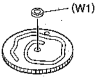


㉚ Brake control arm assembly



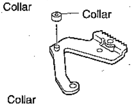
W1,L16

㉟ Main cam



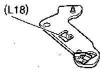
W1

㊱ Arm gear 1 assembly


Collar
Collar

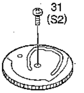
Collar

㊲ Centering arm assembly



L18

㊳ Sub cam

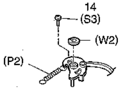


S2

Screw Management															
⑯	⑱				⑲	⑳	㉑	㉜	㉝	㉞		㊳	㊷		
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
No.11	No.12					No.13	No.14	No.17		No.18		No.19	–		

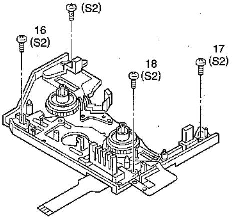
The slit washers cannot be reused once they have been removed.

⑦ Band arm plate assembly



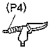
S3,P2,L9,W2

⑪ Sub-deck assembly


15
(S2)
16
(S2)
17
(S2)
18
(S2)

S2×4

⑫ Main brake (SUP) assembly

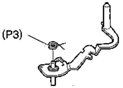


P4,L10

⑬ Main brake (TU) assembly

P5,L11

⑧ Tension arm assembly

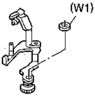


P3

⑭ Reel base assembly (SUP)

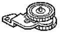
⑮ Reel base assembly (TU)

⑨ Exit guide arm assembly

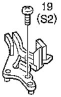


W1

⑩ Swing arm assembly

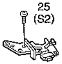


⑯ Prism



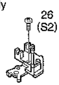
S2

⑳ Base plate (TU) assembly



S2,L14×2

㉑ Entrance guide base assembly

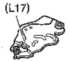


S2

㉒ Worm wheel 2

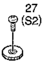
㉓ Timing belt

㉛ Charge arm assembly



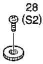
L17

㉜ Connect gear 2



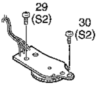
S2

㉝ Connect gear 2



S2

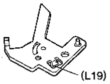
㉞ Rotary encoder assembly



S2×2

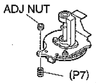
㊴ Arm gear 2 assembly

㊵ Clutch lock lever assembly



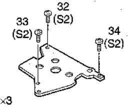
L19

㊶ Capstan motor



ADJ NUT,P7

㊷ Drum base deck


32
(S2)
33
(S2)
34
(S2)

S2×3

2.10 DISASSEMBLY PROCEDURE LIST

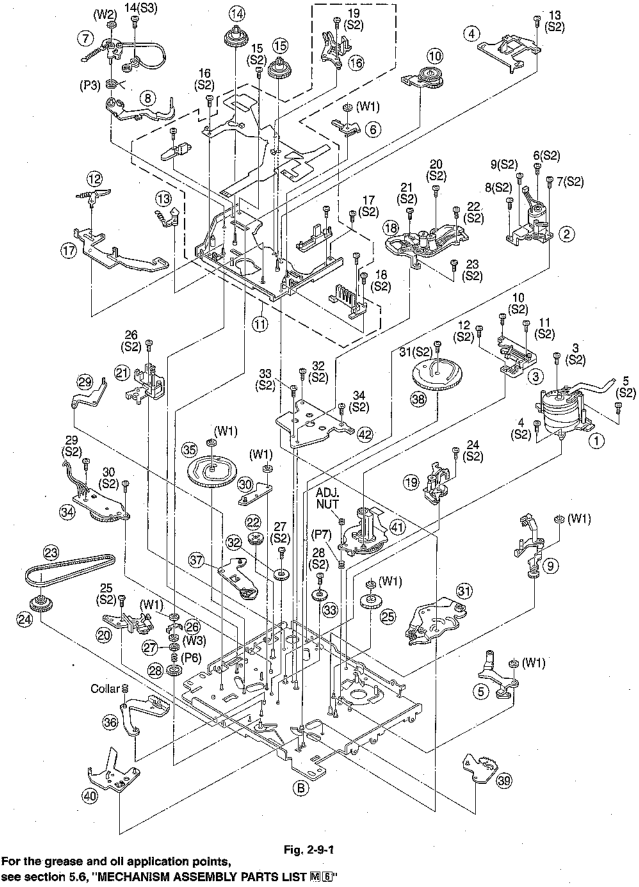
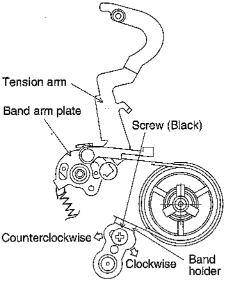

(W2)
14(S3)
⑦
(P3)
⑧
⑭
15
(S2)
⑮
16
(S2)
19
(S2)
⑯
⑩
④
13
(S2)
(W1)
⑥
⑫
⑬
⑰
17
(S2)
20
(S2)
21
(S2)
22
(S2)
⑱
23
(S2)
9(S2)
6(S2)
8(S2)
7(S2)
②
18
(S2)
⑪
10
(S2)
12
(S2)
11
(S2)
③
3
(S2)
5
(S2)
4
(S2)
①
26
(S2)
㉑
㉙
31(S2)
㊳
33
(S2)
32
(S2)
34
(S2)
㊷
29
(S2)
30
(S2)
㉞
(W1)
㉟
(W1)
㉚
24
(S2)
⑲
ADJ.
NUT
㊶
(W1)
⑨
㉒
㉜
27
(S2)
(P7)
28
(S2)
㊲
㉓
㉔
25
(S2)
⑳
(W1)
㉖
(W3)
㉗
(P6)
㉘
㉝
(W1)
㉕
㉛
(W1)
⑤
Collar
㊱
㊵
Ⓑ
㊴

Fig. 2-9-1

Note) For the grease and oil application points,
see section 5.6, "MECHANISM ASSEMBLY PARTS LIST Ⓜ⑥"

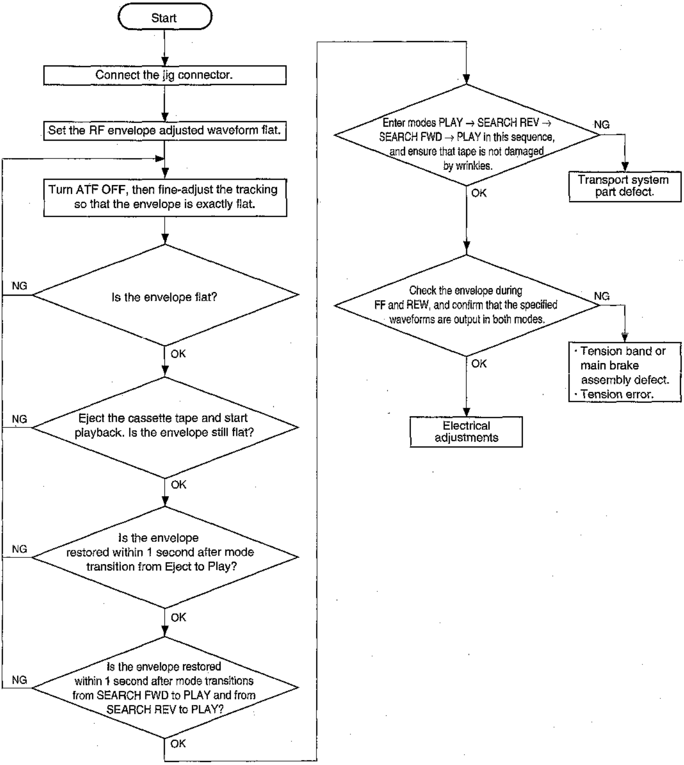
2.11 TORQUE ADJUSTMENTS

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
1	SUP backup torque adjustment	• Cassette torque meter  Tension arm Band arm plate Screw (Black) Counterclockwise Clockwise Band holder	Play	◎ Supply side indica tion of cassette torque meter ☆ $3.9^{+1.47}_{-0.39} \times 10^{-4}$N m ($4.0^{+1.6}_{-0.4}$ gf cm)	(1) nsert the cassette torque meter and enter play mode. (2) The supply backup torque should be as specified. (If it fluctuates, read the center value.) (3) If it is out of specification, eject the tape, remove the cassette housing, loosen the screw (black) slightly and fine-adjust the band holder. Slightly turn the band holder as follows. · To increase torque: Counterclockwise · To decrease torque: Clockwise. NOTE **The screw securing torque should be 0.0588 N-m (0.6 kgf·cm).** 4) Check the supply backup torque again and repeat the above steps until it becomes as specified.
2	TU torque check	• Cassette torque meter	Play	◎ Take-up side indication of cassette torque meter ☆ $4.9^{+3.92}_{-1.96} \times 10^{-4}$N m ($5.0^{+4.0}_{-2.0}$ gf cm)	(1) Insert the cassette torque meter and enter play mode. (2) Ensure that the take-up torque is as specified. If it is out of specification, check the assembly of the reel drive parts and the center gear assembly.

2.12 COMPATIBILITY ADJUSTMENT

2.12.1 Compatibility Adjustment Flow Chart

Fig. 2-12-1 shows the flow chart of compatibility adjustment.



Start
Connect the jig connector.
Set the RF envelope adjusted waveform flat.
Turn ATF OFF, then fine-adjust the tracking so that the envelope is exactly flat.
NG
Is the envelope flat?
OK
NG
Eject the cassette tape and start playback. Is the envelope still flat?
OK
NG
Is the envelope restored within 1 second after mode transition from Eject to Play?
OK
NG
Is the envelope restored within 1 second after mode transitions from SEARCH FWD to PLAY and from SEARCH REV to PLAY?
OK
Enter modes PLAY → SEARCH REV → SEARCH FWD → PLAY in this sequence, and ensure that tape is not damaged by wrinkles.
NG
Transport system part defect.
OK
Check the envelope during FF and REW, and confirm that the specified waveforms are output in both modes.
NG
· Tension band or main brake assembly defect.
· Tension error.
OK
Electrical adjustments

Fig. 2-12-1

2.12.2 Before Adjustments

Table 2-12-1 shows the adjustments to be enforced after servicing.

Adjustment Item / Servicing	2.12.5 Linearity Adjustment	3.6.7 Play Switching Point Adjustment	3.6.8-3 Error Rate (PB EQ) Adjustment	3.6.8-1 REC Current Adjustment
Drum replacement	Note 1 Required	Required	Required	Required
Required	Note 1 Required	Not required	Check	Not required
IC901 replacement (PRE/REC amp on P/R & MDA board)	Not required	Not required	Check	Required
IC501 replacement (PB EQ on DV Main board)	Not required	Not required	Required	Not required
DV Main board replacement Note 2	Not required	Required	Required	Required

Table 2-12-1

Note 1 : Check is required after servicing or replacement related to the drum, TU/SUP guide rails or tension.

Note 2 : After having replaced the DV Main board, be sure to write the original data in the EEPROM (IC103) of the new board. If the original data cannot be written due to communication failure, mount the original EEPROM to the new board.
The following data are written in the EEPROM (IC103) on the DV MAIN board.

- EVR adjustment value data
- Hour meter
- Warning history
- IEEE1394 ID code

2.12.3 Adjustment Setup

As shown in Fig.2-12-2 below, connect the connector cable to CN104 on the DV MAIN board and then connect it to the PC cable.

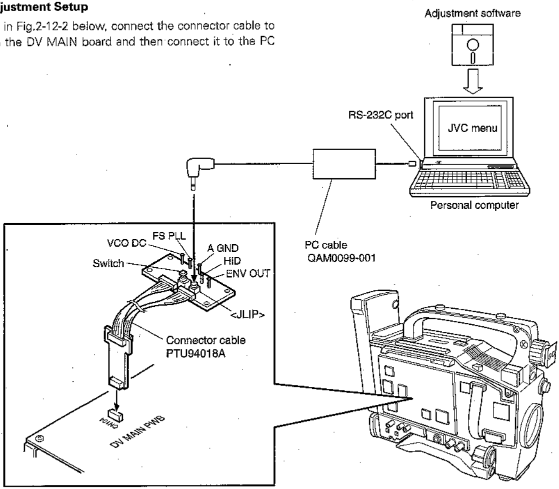

Adjustment software
RS-232C port
JVC menu
Personal computer
PC cable
QAM0099-001
VCO DC
FS PLL
A GND
Switch
HID
ENV OUT
<JLIP>
Connector cable
PTU94018A
CN104
DV MAIN PWB

Fig. 2-12-2 Adjustment Setup

2.12.4 Tape Transport Restriction

The unit uses only the SUP guide roller and TU guide roller to restrict the tape transport. The tape is free (no restriction) from other parts.

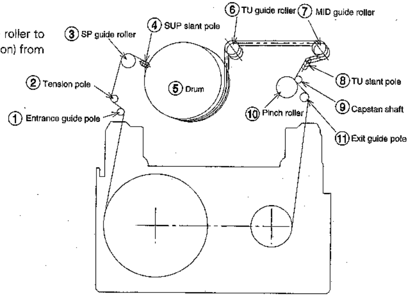

⑥ TU guide roller
⑦ MID guide roller
④ SUP slant pole
③ SP guide roller
② Tension pole
⑤ Drum
⑧ TU slant pole
⑨ Capstan shaft
① Entrance guide pole
⑩ Pinch roller
⑪ Exit guide pole

Fig. 2-12-3

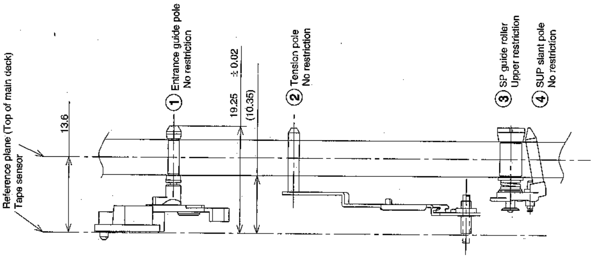

Reference plane (Top of main deck)
Tape sensor
13.6
① Entrance guide pole
No restriction
19.25 ±0.02
(10.35)
② Tension pole
No restriction
③ SP guide roller
Upper restriction
④ SUP slant pole
No restriction

Fig. 2-12-4 Tape Restriction on Supply Side

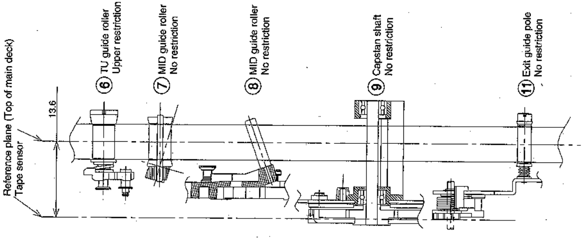
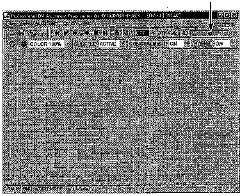
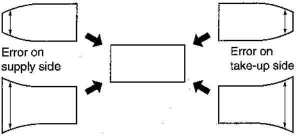

Reference plane (Top of main deck)
Tape sensor
13.6
⑥ TU guide roller
Upper restriction
⑦ MID guide roller
No restriction
⑧ MID guide roller
No restriction
⑨ Capstan shaft
No restriction
⑪ Exit guide pole
No restriction

Fig. 2-12-5 Tape Restriction on Take-up Side

2.12.5 Compatibility Adjustment

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
1	Preparation	Drag here to vary the tracking.  Fig. 2-12-6 PC Display of Adjustment Software			(1) Set up the adjustment software (see section 2.12.3, "Setup") and execute the program. (2) If it is required to switch the auto tracking function, set [ATF] to "OFF". When the ATF Value appears, vary the tracking value as desired. **NOTE** · **Be sure to clean the tape transport parts and play a cleaning tape before proceeding to the compatibility adjustment.**
2	RF envelope adjustment	• Error on supply side Oscilloscope, alignment tape MC-1(NTSC) MC-2(PAL) Color bar portion  Fig. 2-12-7	Play	◎ ENV OUT [jig connector] ◎ HID [jig connector] Ⓣ Supply guide roller Ⓣ Take-up guide roller ☆ Make the waveforms flat. The drop level should be less than 3 dB with both SUP and TU levels. ☆ Flatness variation should be less than 2 dB.	(1) Play alignment tape color bar portion. (2) Observe the measuring points and adjust the supply guide roller and take-up guide roller so that the RF waveform is flat. (3) Set [ATF] to OFF and vary tracking. (4) Fine-adjust the supply and take-up guide rollers to make the waveform exactly flat. (5) Set the mode to EJECT, then set to the PLAY mode and ensure that the RF waveform is flat.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
3	Waveform rise check	• Oscilloscope, alignment tape MC-1(NTSC) MC-2(PAL) Color bar portion	Eject →Play Search FWD →Play Search REV → Play	◎ ENV OUT [jig connector] ◎ HID [jig connector] ☆The envelope waveform should be restored within 1 sec.	(1) Switch the mode from Eject → Play and ensure that the envelope waveform is restored in less than 1 sec. (2) Switch the mode from Search FWD → Play and from Search REV → Play, and ensure that the envelope is restored in less than 1 sec. in both cases. (3) If the waveform does not restore in the specified period, fine-adjust the supply/take-up guide rollers as far as the envelope waveform specification is met, then restart checking from the above procedure 1 again.
4	Damage check	• Self-recorded/ played tape 60ME	Play ↓ Search REV ↓ Search FWD ↓ Play	◎ ENV OUT [jig connector] ◎ HID [jig connector] ☆The tape should not be damaged by wrinkle.	(1) Transport the self-recorded/played tape from the beginning by changing modes in order of Play → Search REV → Search FWD → Play, and ensure that wrinkles due to strong restriction by the guide rollers and guide pole are not produced on tape. (2) Perform the same check at the section near the end of tape.
5	Envelope check during FF/REW	• Oscilloscope, alignment tape MC-1(NTSC) MC-2(PAL) Color bar portion	FF REW	◎ ENV OUT [jig connector] ◎ HID [jig connector] ☆A > 55µsec. ☆B ≧ T/3	(1) Insert the alignment tape and enter Stop mode. (2) Enter FF mode. (3) Ensure that the envelope output is present at 55 (s before the HID switching timing. (4) Check the take-up side of the envelope to see that the MAX output duration is more than 1/3 the HID duration. **This checking should be done after completing the switching point adjustment.** (5) Enter REW mode and check the same items as (3) and (4) above. (6) If the envelope is out of specification, check the tension band and main brake assembly and replace as required. Confirm the playback switching point.

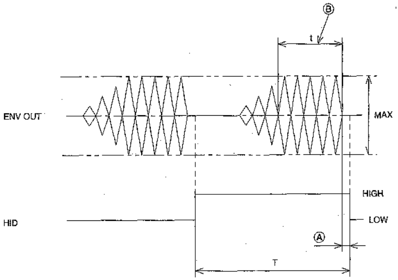
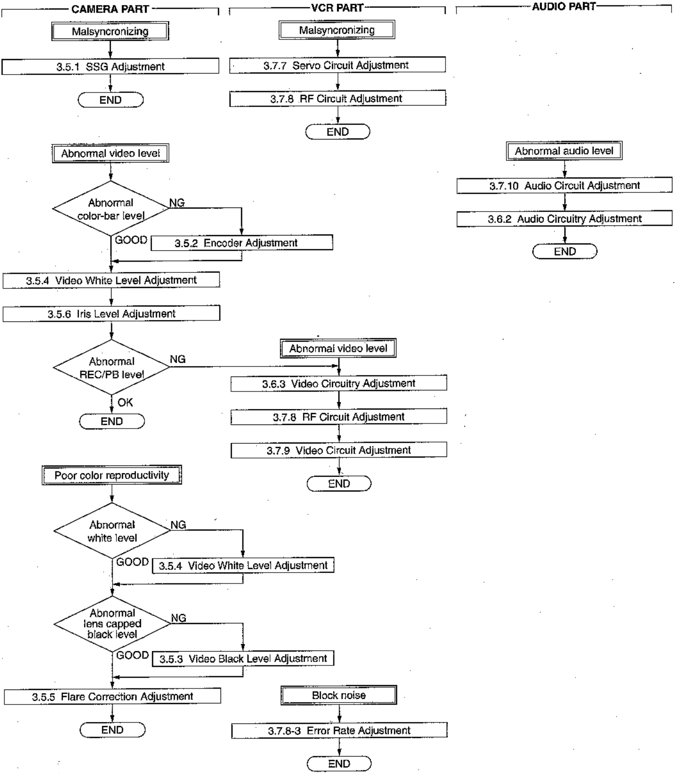


Fig. 2-12-8

SECTION 3
ELECTRICAL ADJUSTMENTS

3.1 FLOWCHART OF ELECTRICAL ADJUSTMENTS



CAMERA PART
Malsyncronizing
3.5.1 SSG Adjustment
END
Abnormal video level
Abnormal color-bar level
NG
GOOD
3.5.2 Encoder Adjustment
3.5.4 Video White Level Adjustment
3.5.6 Iris Level Adjustment
Abnormal REC/PB level
NG
OK
END
Poor color reproductivity
Abnormal white level
NG
GOOD
3.5.4 Video White Level Adjustment
Abnormal lens capped black level
NG
GOOD
3.5.3 Video Black Level Adjustment
3.5.5 Flare Correction Adjustment
END
VCR PART
Malsyncronizing
3.7.7 Servo Circuit Adjustment
3.7.8 RF Circuit Adjustment
END
Abnormal video level
3.6.3 Video Circuitry Adjustment
3.7.8 RF Circuit Adjustment
3.7.9 Video Circuit Adjustment
END
Block noise
3.7.8-3 Error Rate Adjustment
END
AUDIO PART
Abnormal audio level
3.7.10 Audio Circuit Adjustment
3.6.2 Audio Circuitry Adjustment
END

3.2 FUNCTIONS REQUIRED FOR ADJUSTMENTS, SETUP

3.2.1 General instruments necessary for adjustment

Instrument	Condition	Instrument	Condition
Oscilloscope	Calibrated instrument with a measuring bandwidth of 100 MHz or more.	Frequency counter	Instrument calibrated for 8 digits or more. Stability of 0.1 ppm or 1×10^{-7} or better is required at 0 to 40°C.
Vectorscope	Calibrated instrument		
Audio tester	Calibrated instrument	Monitor TV	Color video monitor with a 75Ω video input.

3.2.2 Special implements required for adjustment

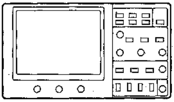
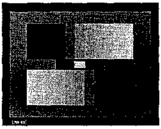
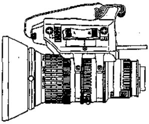
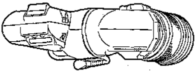
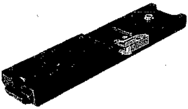
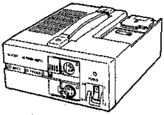
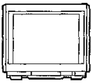
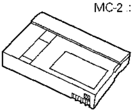
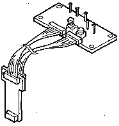
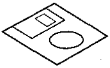
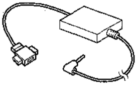
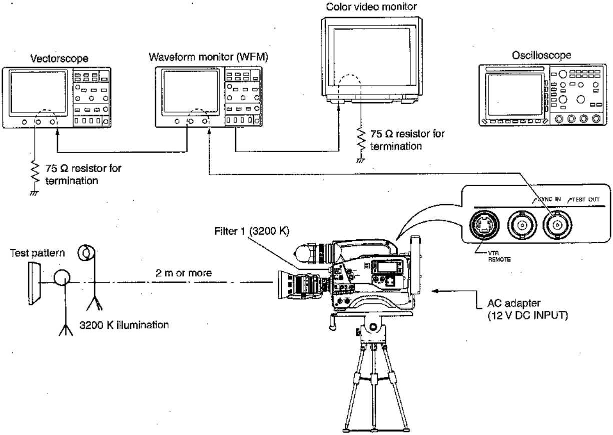
1 Computor	2 Waveform monitor (WFM)	3 Gray scale chart
 Windows 95 or NT		(Part No.:GS2L) 
4 Lens	**5 Viewfinder**	**6 Tripod base**
S14X7.3B12 or equiv. 	VF-P115B or equiv. 	
7 Power supply unit	**8 Monitor TV**	**9 Alignment tape**
AA-P250 or equiv. 		MC-1 : NTSC MC-2 : PAL 
10 Connector cable PTU94018A	**11 Adjustment software PLSC1304**	**12 PC cable QAM0099-001**
		

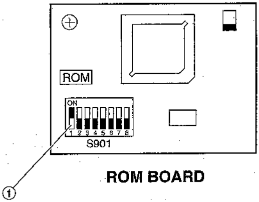
Fig. 3-1-1 Special implements required for adjustment

3.3 STANDARD SETUP

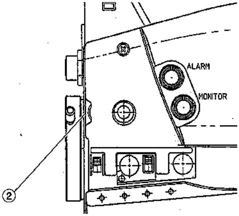

Color video monitor
Vectorscope
Waveform monitor (WFM)
Oscilloscope
75 Ω resistor for termination
75 Ω resistor for termination
SYNC IN
TEST OUT
VTR REMOTE
Filter 1 (3200 K)
Test pattern
2 m or more
3200 K illumination
AC adapter
(12 V DC INPUT)

3.4 ADJUSTMENT MENU

3.4.1 Switches and Functions Used in Adjustments


ROM
ON
1 2 3 4 5 6 7 8
S901
①

ROM BOARD


ALARM
MONITOR
②

① SW901-1 on ROM board	: Set to ON (up) to display the adjustment menu on the viewfinder screen and enter the adjustment mode. Set to OFF (down) to turn off the adjustment menu on the viewfinder screen and exit from the adjustment mode.
② SHUTTER/MENU dial	: Used to select an adjustment item, adjust the selected item and store the adjusted value in memory.

3.4.2 Operation Procedure

(1) Open the right side cover and set the DIP switch SW901-1 on the ROM board to ON (up).

(2) When the cursor on the left of an item is blinking and the adjustment value is lit steadily, rotating the SHUTTER/MENU dial selects the adjustment item. Rotate this dial continuously to turn over the page of the MENU screen.

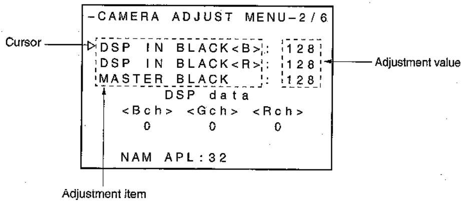
(3) When the cursor on the left of an item is blinking and the adjustment value is lit steadily, pushing the SHUTTER/MENU dial causes the selected item to blink.

(4) When the cursor on the left of an item is blinking and the adjustment value is blinking, rotating the SHUTTER/MENU dial varies the adjustment value.

(5) When the cursor on the left of an item is blinking and the adjustment value is blinking, pushing the SHUTTER/MENU dial stores the adjustment value in memory and returns to the adjustment item selection step.

(6) Set the DIP switch SW901-1 on the ROM board to OFF (down) to exit from the adjustment mode.

Adjustment Menu



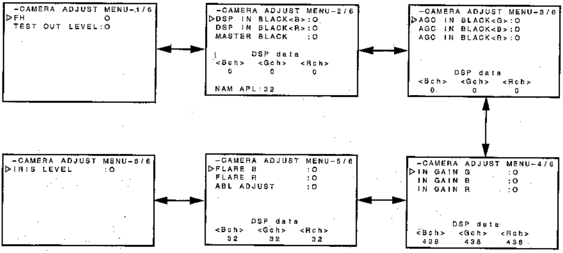
```
-CAMERA ADJUST MENU-2/6
▷DSP IN BLACK<B>: 128
 DSP IN BLACK<R>: 128
 MASTER BLACK   : 128
        DSP data
  <Bch>  <Gch>  <Rch>
    0      0      0

  NAM APL:32
```

Cursor	Adjustment Value	SHUTTER/MENU Dial	
		Rotate	Push
Blinking	Steady lighting	Selects an adjustment item.	Adjustment value blinks.
Blinking	Blinking	Varies an adjustment value.	Stores adjustment value in memory.

Functions of SHUTTER/MENU Dial

3.4.3 Flowchart of ADJUST MENU



```
-CAMERA ADJUST MENU-1/6
▷FH              0
 TEST OUT LEVEL:0
```

```
-CAMERA ADJUST MENU-2/6
▷DSP IN BLACK<B>:0
 DSP IN BLACK<R>:0
 MASTER BLACK   :0

        DSP data
 <Bch>   <Gch>   <Rch>
   0       0       0

 NAM APL:32
```

```
-CAMERA ADJUST MENU-3/6
▷AGC IN BLACK<G>:0
 AGC IN BLACK<B>:0
 AGC IN BLACK<R>:0


         DSP data
 <Bch>   <Gch>   <Rch>
   0       0       0
```

```
-CAMERA ADJUST MENU-4/6
▷IN GAIN G      :0
 IN GAIN B      :0
 IN GAIN R      :0


         DSP data
 <Bch>   <Gch>   <Rch>
  438     438     438
```

```
-CAMERA ADJUST MENU-5/6
▷FLARE B        :0
 FLARE R        :0
 ABL ADJUST     :0

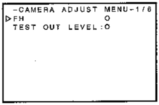
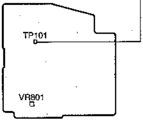

        DSP data
 <Bch>   <Gch>   <Rch>
   32      32      32
```

```
-CAMERA ADJUST MENU-6/6
▷IRIS LEVEL     :0
```

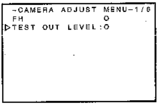
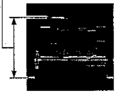
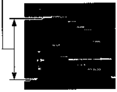
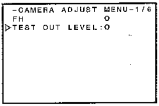
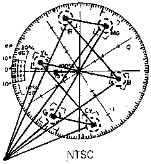
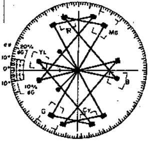
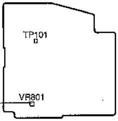
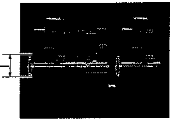
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure

3.5 CAMERA ADJUSTMENTS

3.5.1 SSG Adjustment

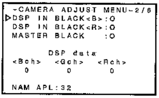
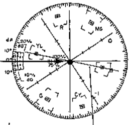
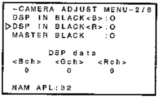
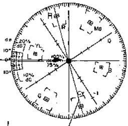
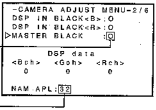
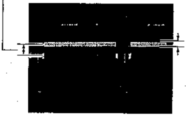
1	fh frequency adjustment  -CAMERA ADJUST MENU-1/6 ▷FH O TEST OUT LEVEL:O	• Frequency counter	Adjustment menu 1/6 (Color bar output) CAM2 board	◎ TP101 (CAM2) ① SHUTTER/MENU dial ☆ 27 MHz ±30 Hz  	(1) Open the left side cover. (2) Rotate the SHUTTER/MENU dial to select MENU 1/6: FH. (3) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (4) Push the SHUTTER/MENU dial to store the adjustment data in memory.

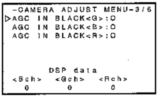
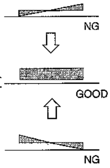
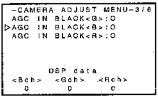
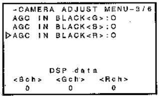
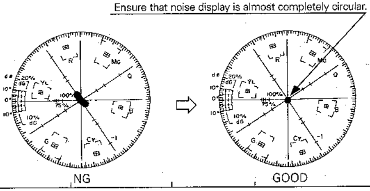
3.5.2 Encoder Adjustments

1	TEST OUT LEVEL adjustment  -CAMERA ADJUST MENU-1/6 FH O ▷TEST OUT LEVEL:O	• Oscilloscope (H-rate, 10:1) or WFM	Adjustment menu 1/6 (Color bar output)	◎ TEST OUT (75 Ω terminated) ① SHUTTER/MENU dial ☆ 1 Vp-p ± 0.003 Vp-p (140 IRE ±4 IRE)  [NTSC]  [PAL]	(1) Rotate the SHUTTER/MENU dial to select MENU 1/6: TEST OUT LEVEL. (2) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (3) Push the SHUTTER/MENU dial to store the adjustment data in memory.
2	CHROMA LEVEL adjustment  -CAMERA ADJUST MENU-1/6 FH O ▷TEST OUT LEVEL:O  NTSC  PAL Adjust so that all the spots are located inside the ⊞ marks.	• Oscilloscope (H-rate, 10:1) or WFM • Vectorscope	Adjustment menu 1/6 (Color bar output)	◎ TEST OUT (75 Ω terminated) ① VR801 (CAM2) ☆ All the spots of the color bar signal should be within the ⊞ marks of the vectorscope and the burst level should be as specified. NTSC 0.286 ± 0.015 Vp-p PAL 0.3 ± 0.015 Vp-p	(1) Open the left side cover. (2) Adjust VR801 on the CAM2 board to the specified level.  CAM2 board 

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure

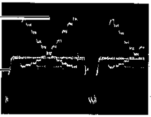
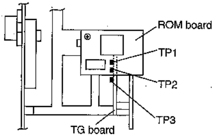
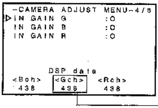
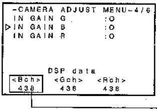
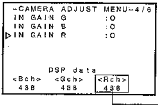
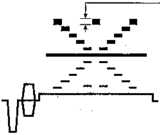
3.5.3 Video Black Level Adjustments

1	DSP IN BLACK adjustment	• Oscilloscope (H-rate, 10:1) or WFM • Vectorscope • Lens capped or iris closed.	Adjustment menu 2/6	◎ TEST OUT (75 Ω terminated) Ⓣ SHUTTER/MENU dial ☆ Position the noise on the B-Y$_L$ axis at the center of the vectorscope.	(1) Rotate the SHUTTER/MENU dial to select MENU 2/6: DSP IN BLACK <B>. (2) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (3) Push the SHUTTER/MENU dial to store the adjustment data in memory.
	 -CAMERA ADJUST MENU-2/6 ▷DSP IN BLACK<B>:0 DSP IN BLACK<R>:0 MASTER BLACK :0 DSP data <Bch> <Gch> <Rch> 0 0 0 NAM APL:32			 B-Y$_L$ axis	
	 -CAMERA ADJUST MENU-2/6 DSP IN BLACK<B>:0 ▷DSP IN BLACK<R>:0 MASTER BLACK :0 DSP data <Bch> <Gch> <Rch> 0 0 0 NAM APL:32			☆ Position the noise on the R-C$_Y$ axis at the center of the vectorscope.  R-C$_Y$ axis	(4) Rotate the SHUTTER/MENU dial to select MENU 2/6: DSP IN BLACK <R>. (5) Push the SHUTTER/MENU dial so that the adjustment value blinks, then rotate it to adjust to the specified level. (6) Push the SHUTTER/MENU dial to store the adjustment data in memory.
				☆ Position NAM APL at the center of 32 MASTER BLACK variation range.  -CAMERA ADJUST MENU-2/6 DSP IN BLACK<B>:0 DSP IN BLACK<R>:0 ▷MASTER BLACK :0 DSP data <Bch> <Gch> <Rch> 0 0 0 NAM APL:32	(7) Rotate the SHUTTER/MENU dial to select MENU 2/6: MASTER BLACK. (8) Push the SHUTTER/MENU dial so that the adjustment value blinks, then rotate it to adjust to the specified level. (9) Push the SHUTTER/MENU dial to store the adjustment data in memory.
					(10) Check the following condition. NTSC 5.3 ± 7 Vp-p PAL 0 ± 7 Vp-p Carrier: less than 30 mVp-p

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
2	AGC IN BLACK adjustment	• Oscilloscope (V-rate, 10:1) or WFM • Lens capped or iris closed. • Vectorscope	Adjustment menu 3/6 GAIN SW H (+18 dB)	◎ TEST OUT (75 Ω terminated) ① SHUTTER/MENU dial ☆ Minimize V shading.	(1) Rotate the SHUTTER/MENU dial to select MENU 3/6: AGC IN BLACK <G>. (2) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (3) Push the SHUTTER/MENU dial to store the adjustment data in memory.
	 -CAMERA ADJUST MENU-3/6 ▷AGC IN BLACK<G>:0 AGC IN BLACK<B>:0 AGC IN BLACK<R>:0 DSP data <Bch> <Gch> <Rch> 0 0 0				
	 -CAMERA ADJUST MENU-3/6 AGC IN BLACK<G>:0 ▷AGC IN BLACK<B>:0 AGC IN BLACK<R>:0 DSP data <Bch> <Gch> <Rch> 0 0 0			☆ Minimize V shading.	(4) Rotate the SHUTTER/MENU dial to select MENU 3/6: AGC IN BLACK <B>. (5) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (6) Push the SHUTTER/MENU dial to store the adjustment data in memory.
	 -CAMERA ADJUST MENU-3/6 AGC IN BLACK<G>:0 AGC IN BLACK<B>:0 ▷AGC IN BLACK<R>:0 DSP data <Bch> <Gch> <Rch> 0 0 0			☆ Minimize V shading.	(7) Rotate the SHUTTER/MENU dial to select MENU 3/6: AGC IN BLACK <R>. (8) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (9) Push the SHUTTER/MENU dial to store the adjustment data in memory.
	 Ensure that noise display is almost completely circular. R MG Q YL B CY G -I 100% 75% 20% dG 10% dG dφ 10° 0° NG GOOD				(10) Check that the noise display on the vectorscope is close to a true circle. If the circle is distorted, repeat (1) to (9) until it approaches a true circle. (11) Set the GAIN SW to L (0dB).

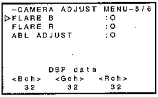
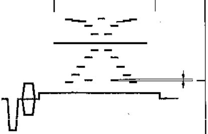
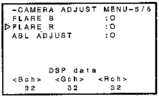
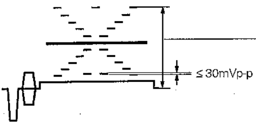
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure

3.5.4 Video White Level Adjustments

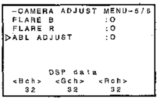
1	IN GAIN adjustment	• Oscilloscope (H-rate, 10:1) or WFM • Gray scale chart (precisely scanned size)	Adjustment menu 4/6 	◎ TP2 (TG,Open the left side cover) ① Lens iris ☆ 1.00 ± 0.01 Vp-p	(1) Rotate the SHUTTER/MENU dial to select MENU 4/6: IN GAIN <G>. (2) Shoot the gray scale chart and adjust the lens iris so that the white peak level is as specified. 
		 -CAMERA ADJUST MENU-4/6 ▷IN GAIN G :0 IN GAIN B :0 IN GAIN R :0 DSP data <Bch> <Gch> <Rch> 438 438 438		◎ TEST OUT (75 Ω terminated) ① SHUTTER/MENU dial ☆ DSP DATA <G>: 515 ± 2	(3) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (4) Push the SHUTTER/MENU dial to store the adjustment data in memory.
		 -CAMERA ADJUST MENU-4/6 IN GAIN G :0 ▷IN GAIN B :0 IN GAIN R :0 DSP data <Bch> <Gch> <Rch> 438 436 438		◎ TEST OUT (75 Ω terminated) ① SHUTTER/MENU dial ☆ DSP DATA <B>: ± 2 of DSP DATA <G>	(5) Rotate the SHUTTER/MENU dial to select MENU 4/6: IN GAIN <B>. (6) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (7) Push the SHUTTER/MENU dial to store the adjustment data in memory.
		 -CAMERA ADJUST MENU-4/6 IN GAIN G :0 IN GAIN B :0 ▷IN GAIN R :0 DSP data <Bch> <Gch> <Rch> 438 438 438		◎ TEST OUT (75 Ω terminated) ① SHUTTER/MENU dial ☆ DSP DATA <R>: ± 2 of DSP DATA <G>	(8) Rotate the SHUTTER/MENU dial to select MENU 4/6: IN GAIN <R>. (9) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (10) Push the SHUTTER/MENU dial to store the adjustment data in memory.
				◎ TEST OUT (75 Ω terminated) ① SHUTTER/MENU dial ☆ Minimize the carrier leak.	(11) Minimize the white carrier leak signal of the video signal by repeating steps (5) to (10). (Carrier leak: less than 30 mVp-p)

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure

3.5.5 Flare Correction Adjustments

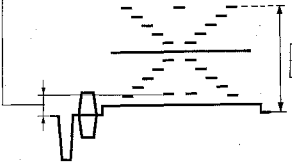
1	Flare adjustment	• Oscilloscope (H-rate, 10:1) or WFM • Gray scale chart (precisely scanned size)	Adjustment menu 5/6	◎ TEST OUT (75 Ω terminated) Ⓣ Lens iris ☆ NTSC 0.714 Vp-p PAL 0.7 Vp-p ⇩ Opened by 1 f-stop	(1) Rotate the SHUTTER/MENU dial to select MENU 5/6: ABL. (2) Shoot the gray scale chart and adjust the lens iris so that the white peak level is 0.714 Vp-p. (3) Open the iris by 1 stop further.
	 -CAMERA ADJUST MENU-5/6 ▷FLARE B :0 FLARE R :0 ABL ADJUST :0 DSP data <Bch> <Gch> <Rch> 32 32 32 			◎ TEST OUT (75 Ω terminated) Ⓣ SHUTTER/MENU dial ☆ Minimize window black carrier leakage.	(4) Rotate the SHUTTER/MENU dial to select MENU 5/6: FLARE <B>. (5) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (6) Push the SHUTTER/MENU dial to store the adjustment data in memory.
	 -CAMERA ADJUST MENU-5/6 FLARE B :0 ▷FLARE R :0 ABL ADJUST :0 DSP data <Bch> <Gch> <Rch> 32 32 32			◎ TEST OUT (75 Ω terminated) Ⓣ SHUTTER/MENU dial ☆ Minimize window black carrier leakage.	(7) Rotate the SHUTTER/MENU dial to select MENU 5/6: FLARE <R>. (8) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (9) Push the SHUTTER/MENU dial to store the adjustment data in memory.
				◎ TEST OUT (75 Ω terminated) Ⓣ SHUTTER/MENU dial. ☆ Minimize window black carrier leakage.	(10) Minimize the black carrier leak signal of the gray scale window by repeating the steps (4) to (9).
				◎ TEST OUT (75 Ω terminated) Ⓣ Lens iris ☆ 0.714 Vp-p (100 IRE) NTSC 0.714 Vp-p PAL 0.7 Vp-p	(11) Adjust the lens iris to return the white peak of the gray scale to 0.714 Vp-p(NTSC) 0.7 Vp-p(PAL). (12) Ensure that the level of the black section of the window is no more than 30 mVp-p.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
2	ABL adjustment	• Oscilloscope (H-rate, 10:1) or WFM • Gray scale chart (precise scanned size)	Adjustment menu 5/6	◎ TEST OUT (75 Ω terminated) Ⓣ SHUTTER/MENU dial ☆ Gray scale chart window black level: NTSC 110 +5/-0 mVp-p PAL 55 +5/-0 mVp-p	(1) Rotate the SHUTTER/MENU dial to select MENU 5/6: ABL. (2) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (3) Push the SHUTTER/MENU dial to store the adjustment data in memory.



```
-CAMERA ADJUST MENU-5/6
 FLARE B          :0
 FLARE R          :0
▷ABL ADJUST       :0

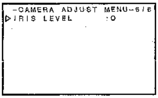

        DSP data
 <Bch>    <Gch>    <Rch>
  32       32       32
```



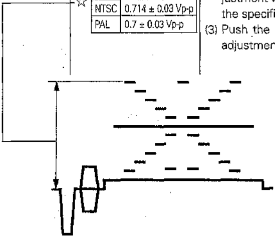
NTSC	0.714 Vp-p
PAL	0.7 Vp-p

3.5.6 Iris Level Adjustment

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
1.	IRIS LEVEL adjustment	• Oscilloscope (H-rate, 10:1) or WFM • Monitor TV • Gray scale chart (precise scanned size)	Adjustment menu 6/6	◎ TEST OUT (75 Ω terminated) Ⓣ SHUTTER/MENU dial ☆ NTSC 0.714 ± 0.03 Vp-p PAL 0.7 ± 0.03 Vp-p	(1) Rotate the SHUTTER/MENU dial to select MENU 6/6: IRIS LEVEL. (2) Push the SHUTTER/MENU dial so that the adjustment value blinks then rotate it to adjust to the specified level. (3) Push the SHUTTER/MENU dial to store the adjustment data in memory.



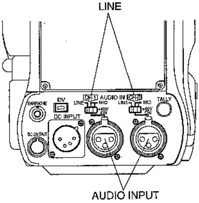
```
-CAMERA ADJUST MENU-6/6
▷IRIS LEVEL       :0
```

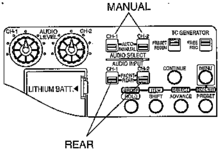


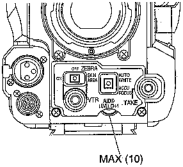
3.6 VCR ADJUSTMENTS

3.6.1 Audio Circuitry Adjustments

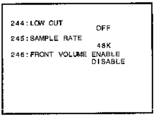
Before adjustments, set the audio switches, menu and potentiometer as follows.


LINE
EARPHONE
DV
DC INPUT
DC OUTPUT
CH-1 AUDIO IN CH-2
LINE MIC
+48V ON
TALLY
AUDIO INPUT


MANUAL
CH-1
AUDIO LEVEL
CH-2
AUTO MANUAL
AUDIO SELECT
AUDIO INPUT
FRONT REAR
TC GENERATOR
PRESET REGEN
FREE REC
CONTINUE
MENU
LITHIUM BATT.
GROUP HOLD
ITEM SHIFT
SELECT ADVANCE
DATA SET PRESET
REAR


ZEBRA
OFF
SKIN AREA
AUTO WHITE
ACCU FOCUS
VTR
AUDIO LEVEL CH-1
TAKE
MAX (10)

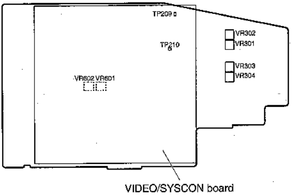
ITEM MENU
AUDIO



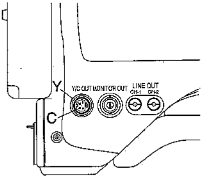
```
244:LOW CUT          OFF
245:SAMPLE RATE      48K
246:FRONT VOLUME     ENABLE
                     DISABLE
```

* Refer to page 67 of the instruction book.

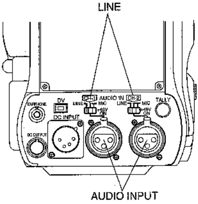
- Potentiometer and measuring points for adjustments


TP209
TP210
VR302
VR301
VR303
VR304
VR602 VR601
VIDEO/SYSCON board

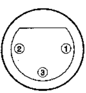
AUDIO/LCD board


Y
C
Y/C OUT
MONITOR OUT
LINE OUT
CH-1
CH-2

Y/C OUT terminal


LINE
EARPHONE
DV
DC INPUT
DC OUTPUT
CH-1 AUDIO IN CH-2
LINE MIC
+48V ON
TALLY
AUDIO INPUT

Rear panel



No.	SIGNAL
①	GND
②	HOT
③	COLD

AUDIO IN connector

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure

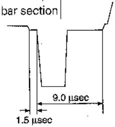
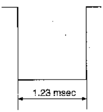
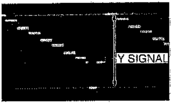
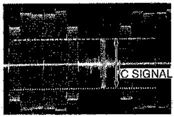
3.6.2 Audio Circuitry Adjustments

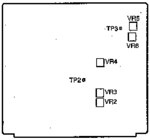
Note : Before proceeding to section "3.5.2 Audio Circuitry Adjustments", complete "3.6.10 Audio Circuitry Adjustment of DV Unit".

1	Preparation				Before adjustments, set the audio switches, menu and potentiometer as follows: [Switches] AUDIO IN : LINE AUDIO INPUT : REAR AUDIO SELECT : MANU [Menu] LOW CUT : OFF SAMPLING RATE : 48KHz FRONT VOLUME ENABLE : DISABLE [Potentiometer(Front panel)] AUDIO LEVEL CH1 : MAX (10)
2	INPUT LEVEL adjustment	• 1kHz,+4dBs • Audio tester	EE	◎ TP209 (CH1) [AUDIO LCD] Ⓣ VR201 (CH1) [AUDIO LCD] ◎ TP210 (CH2) [AUDIO LCD] Ⓣ VR202 (CH2) [AUDIO LCD] ☆ –22 dBs	(1) Apply a +4 dBs signal to the AUDIO INPUT connector of REAR and adjust the adjustment points so that the levels at the measuring points are as specified.
3	OUTPUT LEVEL adjustment	• 1kHz,+4dBs • Audio tester	EE	◎ LINE OUT Ⓣ VR302 (CH1) [AUDIO LCD] Ⓣ VR303 (CH2) [AUDIO LCD] ☆ –6 dBs	(1) Perform this adjustment after completing 2 above. (2) Apply a +4 dBs signal to the AUDIO INPUT connector of REAR and adjust the adjustment points so that the levels at the measuring points are as specified.
4	Record/play level adjustment	• 1kHz,+4dBs • Audio tester	Self-recording/ playback	◎ LINE OUT Ⓣ VR301 (CH1) [AUDIO LCD] Ⓣ VR304 (CH2) [AUDIO LCD] ☆ –6 dBs	(1) Perform this adjustment after completing 2 and 3 above. (2) Apply a +4 dBs signal to the AUDIO INPUT connector of REAR and record the audio onto tape. (3) Play the tape recorded in (2) and adjust the adjustment points so that the levels at the measuring points are as specified.
5	Level meter adjustment	• 1kHz,+4dBs	EE	◎ LCD Ⓣ VR601 (CH1) [AUDIO LCD] Ⓣ VR602 (CH2) [AUDIO LCD] ☆ LCD's audio level meter display: "–20"	(1) Perform this adjustment after completing 2,3 and 4 above. (2) Apply a +4 dBs signal to the AUDIO INPUT connector of REAR and adjust the adjustment points so that the audio level meter of LCD indicates "–20" for both channels.

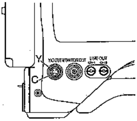
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure

3.6.3 Video Circuitry Adjustments

1	SETUP PULSE adjustment	• Oscilloscope (V-rate, 10:1) • MC-1:NTSC MC-2:PAL (alignment tape) color bar section 	PB SETUP: ON (MENU)	◎ TP3[VIDEO/SYSCON] ① VR2[VIDEO/SYSCON] ☆ 9.0 ± 0.1 µs ① VR3[VIDEO/SYSCON] ☆ 1.5 ± 0.1 µs	(1) Play the color bar section of alignment tape MC-1 / MC-2. (2) Adjust the adjustment point so that the initial duration of the SETUP pulse (see diagram on the left) is as specified. (3) Adjust the adjustment point so that the negative-going duration of the SETUP pulse is as specified.
2	DELETE PULSE adjustment (NTSC only)	• Oscilloscope (V-rate, 10:1) • MC-1 (alignment tape) color bar section	PB SETUP: ON (MENU)	◎ TP2[VIDEO/SYSCON] ① VR4[VIDEO/SYSCON] ☆ 1.23 ms 	(1) Play the color bar section of alignment tape MC-1. (2) Adjust the adjustment point so that the pulse duration at the measuring point is as specified.
3	Y LEVEL adjustment 	• Oscilloscope (H-rate)	Color bar EE	◎ Y signal output (75Ω terminated) ① VR6[VIDEO/SYSCON] ☆ 1.0 Vp-p	(1) Set the camera to the color bar mode. (2) With the VCR set to EE, adjust the adjustment point so that the Y signal level in Y/C OUT is as specified.
			Color bar EE	◎ Y signal output (75Ω terminated) ① Adjustment software ☆ 1.0 Vp-p	(3) Adjust the Y signal level to the specified level using the adjustment software (see section 3.7.9-1).
4	C LEVEL adjustment 	• Oscilloscope (H-rate)	Color bar EE	◎ C signal output(75Ω terminated) ① VR5[VIDEO/SYSCON] ☆ NTSC 0.286 Vp-p PAL 0.3 Vp-p burst level	(1) Set the camera to the color bar mode. (2) With the VCR set to EE, adjust the adjustment point so that the C signal level in Y/C OUT is as specified.
			Color bar EE	◎ C signal output (75Ω terminated) ① Adjustment software ☆ NTSC 0.286 Vp-p PAL 0.3 Vp-p burst level	(3) Adjust the C signal level to the specified level using the adjustment software (see section 3.7.9-2).



VIDEO/SYSCON board



Y/C output

3.7 DV ADJUSTMENTS (USING ADJUSTMENT SOFTWARE)

3.7.1 Precautions

(1) The adjustments of the DV circuit (VTR Unit) of this model require a PC. These adjustments are necessary after replacement of the following parts.

- **EEPROM (IC103 on DV Main board)**
- **Mechanism parts**

In case of a problem with the electrical circuit, be sure to identify the point of the trouble first by using measuring instruments. Do not proceed to repair, replacement or adjustment unless the location of the trouble has been identified.

(2) When observing a TP on a chip, avoid applying stress by using an IC clip, etc. In order to prevent the pattern from being peeled off when replacing a chip part, particularly in the case of an IC, remove the solder completely before removing the part.

(3) The connectors tend to be broken easily. Be careful when unplugging or plugging a wire.

(4) Before starting any adjustments, be sure to save the EEPROM data in a PC file for use as backup data in case of an adjustment failure (see section 3.7.12).

(5) When the adjustment software is run, a tape can be recorded even if its REC SAVE tab is set to "SAVE". Be careful not to record anything onto an alignment tape by mistake.

(6) When the adjustment software is run, the operations performed on the main unit do not cause the VCR Unit to function accordingly.

(7) When loading a tape into the GY-DV500, at the same time the power is turned on while the tape is loaded, the unit automatically enters the REC PAUSE mode. To cancel the REC PAUSE mode, press the STOP buttons both of the main unit and of the adjustment software.

(8) When the adjustment software is run, set the Menu switch "VIDEO 126 :INPUT SELECT" to "IEEE1394" . (Only U-ver.)

3.7.2 Equipment Required for Adjustments

① PC (Windows machine. Recommended CPU: Pentium 133 MHz or more)
② Color TV monitor
③ Oscilloscope (2-trace, 100 MHz or more)
  * 300 MHz or more recommended.
④ Digital voltmeter
⑤ Frequency counter (with threshold level adjustment)
⑥ Tape for use in recording/playback (JVC ME60)
⑦ Cleaning tape

3.7.3 Setup for PC Adjustment

Note: This switch is not used with the adjustments of the GY-DV500.

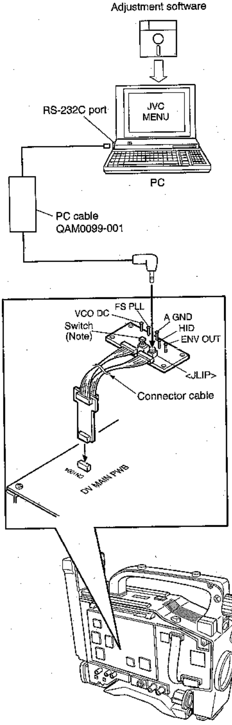


Fig. 3-7-1 **Setup for PC Adjustment**

3.7.4 Installing the Adjustment Software

Insert the floppy disk of the adjustment software and run "Setup.exe". "Professional DV Adjustment" will be created in "Program" under the Start menu.

3.7.5 Operating the Adjustment Software

1. Startup

Execute "Professional DV Adjustment". When the following screen appears, click <OK> because the adjustment software automatically reads the EEPROM data at the start.

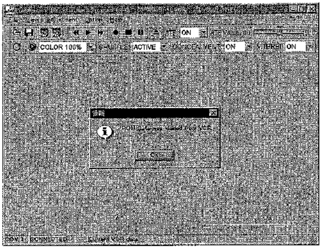
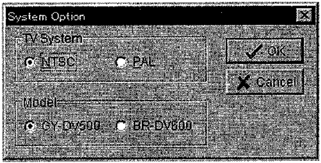

COLOR 100%
SHUFFLE ACTIVE
CONCEALMENT ON
VITERBI ON
OK

Fig. 3-7-2

The following screen appears when [System Option...] under the [Option] tab is clicked, or the first time that the software is started up. Select the "TV System" and "Model" and click <OK>. This setting is also operative during the next startup. (With the domestic models, select "NTSC" (or "PAL" and "GY-DV500".)

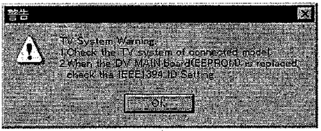

System Option

TV System: ● NTSC ○ PAL

Model: ● GY-DV500 ○ BR-DV600

Fig. 3-7-3

If the set "TV System" differs from the setting in the adjustment software, the following warning message appears. Set "TV System" correctly. If the IEEE 1394 ID is not set, the message appears too. Set the ID correctly. (See 3.6.13)


警告

TV System Warning
1.Check the TV system of connected model.
2.When the DV MAIN Board(EEPROM) is replaced,
check tha IEEE1394 ID Setting.

Fig. 3-7-4

2. Function description

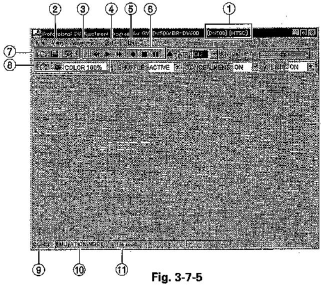

②
③
④
⑤
⑥
①
⑦
⑧
⑨
⑩
⑪
COLOR 100%
ACTIVE
CONCEALMENT ON
VITERBI ON

Fig. 3-7-5

① TV System and Model window
Shows the TV system and model selected for the software in [System Option...].

② [View] tab

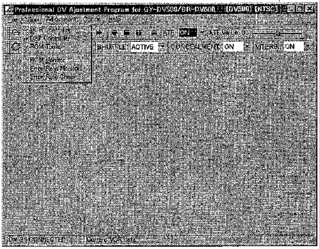

Professional DV Ajustment Program for GY-DV500/BR-DV600 [DV500] [NTSC]
File View Adjustment Option Help
VCR Controller
DSP Controller
ROM Tools
ROM Monitor
Error Rate Monitor
Error Rate Check
ATF ON
ATF Value
SHUFFLE ACTIVE
CONCEALMENT ON
VITERBI ON
COM1 CONNECTED
Current VCR data

Fig. 3-7-6

- VCR Controller " ⑥ "
- DSP Controller " ⑧ "
- ROM Tools " ⑦ "
- ROM Monitor
- Error Rate Monitor
- Error Rate Check

Switch each item ON or OFF.
The details will be described later.

③ [Adjustment] tab
- Adjustment Explorer (Adjustment menu)
- Active Head Cleaner Adjustment
  Forced operation mode for use in adjusting the position of the active head cleaner installation. (See 3.7.14.)

Switch each item ON or OFF.

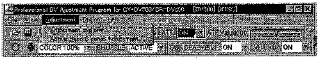

Professional DV Ajustment Program for GY-DV500/BR-DV600 [DV500] [NTSC]
File View Adjustment Option Help
Adjustment Explorer
Active Head Cleaner Adjustment
ATF ON
ATF Value
COLOR 100%
SHUFFLE ACTIVE
CONCEALMENT ON
VITERBI ON

Fig. 3-7-7

④ [Option] tab

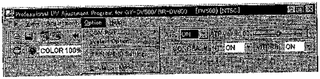
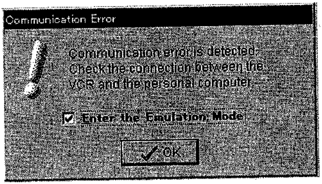

Professional DV Ajustment Program for GY-DV500/BR-DV600 [DV500] [NTSC]
File
View
Adjustment
Option
Help
COM Port
System Option...
IEEE1394 ID Setting
Emulation Mode
COLOR 100%
ATF ON
ATF value 00
CONCEALMENT ON
VITERBI ON

Fig. 3-7-8

- COM Port selection
  From COM1 to COM4, select the COM port to which the communication cable is connected.
- System Option...
  Select the TV signal format and the model of the connected VCR.
- IEEE1394 ID Setting
  ID setting utility of the IEEE1394 standard. (See 3.7.13.)
- Emulation Mode ON/OFF
  The emulation mode makes it possible to use the adjustment software even when communication with the VCR is not available. As the following window is displayed in case of a communication error, check "Enter the Emulation Mode".



Communication Error

Communication error is detected. Check the connection between the VCR and the personal computer.

☑ Enter the Emulation Mode

✓ OK

Fig. 3-7-9

⑤ [Help] tab
Displays the version information of the adjustment software.

⑥ VCR Controller
Controls the VCR operations.

⑦ ROM Tools
Used to check, save, print, modify the memory in the EEPROM (IC103 on DV Main board) or to initialize it. (See 3.7.12.)

⑧ DSP Controller
Used to control the TV signal generator in the VTR Unit, switch SHUFFLE, CONCEALMENT and VITERBI ON/OFF. Clicking "↻" resets them to the defaults.

⑨ COM port display
Shows the COM port in use.

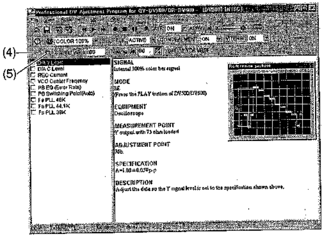
⑩ Communication status display
Shows one of the following messages according to the communication status.
CONNECTED: Normal communication
UNKNOWN: Communication error
EMULATION MODE: In emulation mode

⑪ ROM file display
Shows the file name or "Current VCR data" while a ROM tool reads EEPROM data. Clicking [ROM Monitor] under the ② [View] tab displays the data contents.

3.7.6 Common Operations for Adjustments

Note: Before adjustment, be sure to save the EEPROM data in a PC file as the backup for use in case of adjustment failure. (See 3.6.12.)

(1) Under the [Adjustment] tab, check [Adjustment Explorer].


(4)
(5)
Professional DV Ajustment Program for GY-DV500/BR-DV600 - [DV500] [NTSC]
COLOR 100%
SHUFFLE ACTIVE
CONCEALMENT ON
VITERBI ON
ATF ON
ATF value 00
Current value 80
New value 80
PB Y Level
D/A C Level
REC Current
VCO Center Frequency
PB EQ (Error Rate)
PB Switching Point(Auto)
Fs PLL 48K
Fs PLL 44.1K
Fs PLL 36K
Reference picture
COM1 CONNECTED

SIGNAL
Internal 100% color bar signal

MODE
PB
(Press the PLAY button of DV500/DV600)

EQUIPMENT
Oscilloscope

MEASUREMENT POINT
Y output with 75 ohm loaded

ADJUSTMENT POINT
76h

SPECIFICATION
A=1.00±0.05Vp-p

DESCRIPTION
Adjust the data so the Y signal level is set to the specification shown above.

Fig. 3-7-10

(2) Click the desired adjustment items.

(3) To monitor the video output from the VCR Unit, press the PLAY button of the operation switches of the main unit. If the color bar signal has been recorded in the VCR Unit, the playback screen becomes as shown below, but this is not a malfunction (BR-DV600).

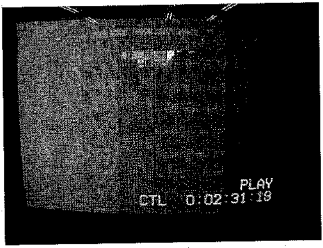

PLAY
CTL 0:02:31:19

Fig. 3-7-11

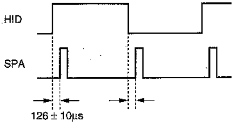
(4) After completing each adjustment item, click the "v" marking, then switch the set OFF.

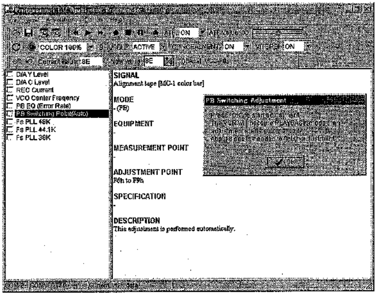
(5) To cancel the adjutment, click the "G" marking.
Note: If another adjustment is started without clicking the "v" marking, the previous adjustment cannot be stored in memory.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure

3.7.7 Servo Circuit Adjustment

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
1	PB switching point adjustment	• Alignment tape MC-1, color bar	PB	Automatic adjustment ☆ Adjustment is performed automatically so that the timings of HID and SPA signals are as shown below.	(1) Click [PB Switching Point (Auto)]. (2) Click [OK] to start automatic adjustment. (3) Message "Complete" is displayed when the adjustment has completed successfully. If it is unsuccessful, the message "Adjustment failed" is displayed; try adjustment again.





☐ D/A Y Level
☐ D/A C Level
☐ REC Current
☐ VCO Center Freqency
☐ PB EQ (Error Rate)
☐ PB Switching Point(Auto)
☐ Fs PLL 48K
☐ Fs PLL 44.1K
☐ Fs PLL 38K

SIGNAL
Alignment tape [MC-1 color bar]

MODE
-(PB)

EQUIPMENT
-

MEASUREMENT POINT
-

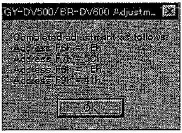
ADJUSTMENT POINT
F6h to F9h

SPECIFICATION
-

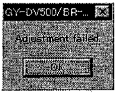
DESCRIPTION
This adjustment is performed automatically.

PB Switching Adjustment
Press "OK" to start adjustment.
The VCR will become PLAYBACK mode then adjustment starts automatically.
About 8 sec is needed to finish adjustment.

COM 2 : CONNECTED Current VCR data


GY-DV500/BR-DV600 Adjustm...
Completed adjustment as follows
Address F6h = 1Eh
Address F7h = 5Ch
Address F8h = 1Eh
Address F9h = 41h
OK

"Complete" message

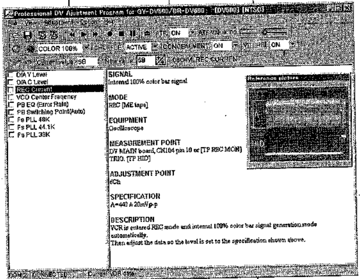

GY-DV500/BR-...
Adjustment failed
OK

"failed" message

No.	Item	Measuring instruments & input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure

3.7.8 RF Circuit Adjustment

1	REC current adjustment	• Internal Color bars (100%) • Oscilloscope	REC	◎ TP REC MON (connector cable) Ⓣ 6Ch ☆ 440 ± 20 mVp-p	**Note: Connect TP to the section indicated [REC MON] on the jig connector in advance.** (1) Click [REC Current]. (2) Click the [OK] button. (3) Adjust "New value" (address "6Ch") so that the level becomes the adjustment level. (4) After adjustment, click the "v" marking and set the power button of the set to OFF.


Professional DV Ajustment Program for GY-DV500/BR-DV600 : [DV500] [NTSC]
File View Adjustment Option Help
ATF ON
ATF Value 00
COLOR 100%
SHUFFLE ACTIVE
CONCEALMENT ON
VITERBI ON
Current value 58
New value 58
06CH/L REC CURRENT
☐ D/A Y Level
☐ D/A C Level
☐ REC Current
☐ VCO Center Frequency
☐ PB EQ (Error Rate)
☐ PB Switching Point(Auto)
☐ Fs PLL 48K
☐ Fs PLL 44.1K
☐ Fs PLL 38K
Reference picture
COM 2 CONNECTED
Current VCR data

SIGNAL
Internal 100% color bar signal

MODE
REC [ME tape]

EQUIPMENT
Oscilloscope

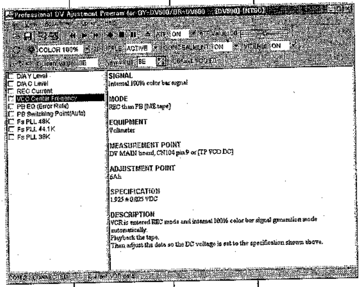
MEASUREMENT POINT
DV MAIN board, CN104 pin 10 or [TP REC MON]
TRIG. [TP HID]

ADJUSTMENT POINT
6Ch

SPECIFICATION
A=440 ± 20mVp-p

DESCRIPTION
VCR is entered REC mode and internal 100% color bar signal generation mode automatically.
Then adjust the data so the level is set to the specification shown above.

2	VCO center frequency adjustment	• Internal Color bars (100%) • Digital voltmeter	REC ↓ PB	◎ TP VCO DC (connector cable) Ⓣ 6Ah ☆ 1.925 ± 0.025 V	(1) Click [VCO Center Frequency]. (2) Click the [OK] button. (3) Play the tape section containing color bars. (4) Adjust "New value" (address "6Ah") so that the level becomes the adjustment level. (5) After adjustment, click the "v" marking and set the power button of the set to OFF.


Professional DV Ajustment Program for GY-DV500/BR-DV600 : [DV500] [NTSC]
File View Adjustment Option Help
ATF ON
ATF Value 00
COLOR 100%
SHUFFLE ACTIVE
CONCEALMENT ON
VITERBI ON
Current value 8E
New value 8E
06Ah/L VCO F0
☐ D/A Y Level
☐ D/A C Level
☐ REC Current
☐ VCO Center Frequency
☐ PB EQ (Error Rate)
☐ PB Switching Point(Auto)
☐ Fs PLL 48K
☐ Fs PLL 44.1K
☐ Fs PLL 38K
COM 2 CONNECTED
Current VCR data

SIGNAL
Internal 100% color bar signal

MODE
REC then PB [ME tape]

EQUIPMENT
Voltmeter

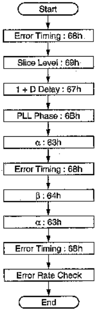
MEASUREMENT POINT
DV MAIN board, CN104 pin 9 or [TP VCO DC]

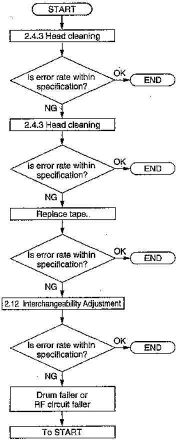
ADJUSTMENT POINT
6Ah

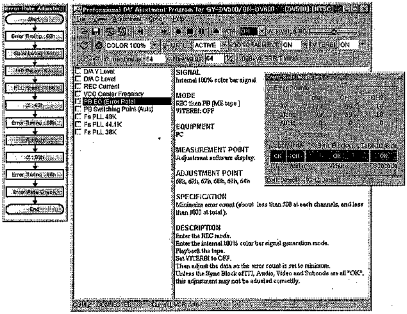
SPECIFICATION
1.925 ± 0.025 VDC

DESCRIPTION
VCR is entered REC mode and internal 100% color bar signal generation mode automatically.
Playback the tape.
Then adjust the data so the DC voltage is set to the specification shown above.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (ⓣ) Adjustment level (☆)	Adjustment procedure
3	PB EQ (Error rate) adjustment	• Internal color bars (100%) • PC	• REC ↓ PB • VITERBI : OFF	◎ PC monitor ⓣ 68 h, 69h, 67h, 6Bh, 63h, 64h ☆ Minimize error rate (Total less than 1000, and less than 500 at each channels)	**Notes:** • Use a new tape or non-used section of tape in this adjustment. • Be sure to clean the head before this adjustment. • It takes about 1 second from the data change to its reflection in the error rate. • Also measure the error rate after the "Sync Block" monitor has become perfectly OK. • If the adjustment within specification is not possible, clean the head. If the next adjustment is still out of specification, use another tape. (1) Click [PB EQ (Error rate)]. (2) Click the [OK] button. (3) Adjust "New value" of each address to minimize the error rate, by following the order shown in the flow chart. (4) After adjustment, click the "v" marking and set the power button of the set to OFF.


Start
Error Timing : 68h
Slice Level : 69h
1 + D Delay : 67h
PLL Phase : 6Bh
α : 63h
Error Timing : 68h
β : 64h
α : 63h
Error Timing : 68h
Error Rate Check
End


START
2.4.3 Head cleaning
Is error rate within specification?
OK
END
NG
2.4.3 Head cleaning
Is error rate within specification?
OK
END
NG
Replace tape.
Is error rate within specification?
OK
END
NG
2.12 Interchangeability Adjustment
Is error rate within specification?
OK
END
NG
Drum failer or RF circuit failer
To START


Error Rate Adjustment
Start
Error Timing : 68h
Slice Level : 69h
1+D Delay : 67h
PLL Phase : 6Bh
α : 63h
Error Timing : 68h
β : 64h
α : 63h
Error Timing : 68h
Error Rate Check
End
Professional DV Ajustment Program for GY-DV500/BR-DV600
File View Adjustment Option Help
ATF ON
ATF Value
COLOR 100%
SHUFFLE ACTIVE
CONCEALMENT ON
VITERBI ON
Current value 64
New value 64
068 VA ERR TIMING
☐ D/A Y Level
☐ D/A C Level
☐ REC Current
☐ VCO Center Freqency
☐ PB EQ (Error Rate)
☐ PB Switching Point (Auto)
☐ Fs PLL 48K
☐ Fs PLL 44.1K
☐ Fs PLL 32K
Error Counter
Total
CH1
CH2
Video
Audio
Sync Block
ITI
Audio
Video
Subcode
OK
CH1 Detect
CH2 Detect
COM2 CONNECTED
Current VOR data

SIGNAL
Internal 100% color bar signal

MODE
REC then PB [ME tape]
VITERBI: OFF

EQUIPMENT
PC

MEASUREMENT POINT
Adjustment software display.

ADJUSTMENT POINT
68h, 69h, 67h, 6Bh, 63h, 64h

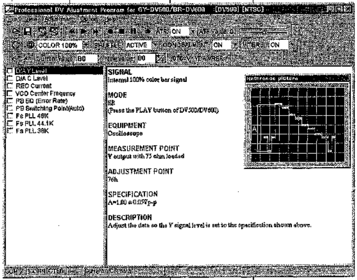
SPECIFICATION
Minimize error count (about less than 500 at each channels, and less than 1000 at total).

DESCRIPTION
Enter the REC mode.
Enter the internal 100% color bar signal generation mode.
Playback the tape.
Set VITERBI to OFF.
Then adjust the data so the error count is set to minimum.
Unless the Sync Block of ITI, Audio, Video and Subcode are all "OK", this adjustment may not be adusted correctly.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure

3.7.9 Video Circuit Adjustments

1	D/A Y level adjustment	• Internal color bars (100%) • Oscilloscope	EE (With PLAY lit on the set)	◎ Y OUT (75 Ω terminated) ① 76h ☆ 1.00 ± 0.05 Vp-p	(1) Click [D/A Y Level]. (2) Click the [OK] button. (3) Press the "PLAY" button of the set and check that the LED lights up. (4) Adjust "New value" (address "76h") so that the Y level becomes the adjustment level. (5) After adjustment, click the "v" marking and set the power button of the set to OFF.


Professional DV Ajustment Program for GY-DV500/BR-DV600 [DV500] [NTSC]

ATF ON ATF Value 00
COLOR 100% SHUFFLE ACTIVE CONCEALMENT ON VITERBI ON
Current value 80 New value 80

☐ D/A Y Level
☐ D/A C Level
☐ REC Current
☐ VCO Center Freqency
☐ PB EQ (Error Rate)
☐ PB Switching Point(Auto)
☐ Fs PLL 48K
☐ Fs PLL 44.1K
☐ Fs PLL 38K

SIGNAL
Internal 100% color bar signal

MODE
EE
(Press the PLAY button of DV500/DV600)

EQUIPMENT
Oscilloscope

MEASUREMENT POINT
Y output with 75 ohm loaded

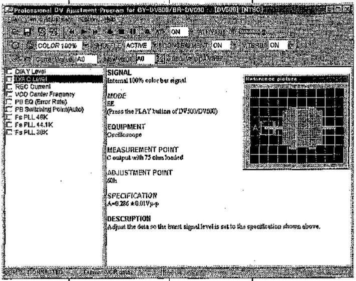
ADJUSTMENT POINT
76h

SPECIFICATION
A=1.00 ±0.05Vp-p

DESCRIPTION
Adjust the data so the Y signal level is set to the specification shown above.

COM 2 CONNECTED

2	D/A C level adjustment	• Internal color bars (100%) • Oscilloscope	EE (With PLAY lit on the set)	◎ C OUT (75 Ω terminated) ① 60h ☆ NTSC 0.286 ± 0.01 Vp-p PAL 0.30 ± 0.01 Vp-p (Burst)	(1) Click [D/A C Level]. (2) Click the [OK] button. (3) Press the "PLAY" operation button of the set and check that the LED lights up. (4) Adjust "New value" (address "60h") so that the burst level becomes the adjustment level. (5) After adjustment, click the "v" marking and set the power button of the set to OFF.


Professional DV Ajustment Program for GY-DV500/BR-DV600 [DV500] [NTSC]

ATF ON ATF Value 00
COLOR 100% SHUFFLE ACTIVE CONCEALMENT ON VITERBI ON
Current value A0 New value A0

☐ D/A Y Level
☐ D/A C Level
☐ REC Current
☐ VCO Center Freqency
☐ PB EQ (Error Rate)
☐ PB Switching Point(Auto)
☐ Fs PLL 48K
☐ Fs PLL 44.1K
☐ Fs PLL 38K

SIGNAL
Internal 100% color bar signal

MODE
EE
(Press the PLAY button of DV500/DV600)

EQUIPMENT
Oscilloscope

MEASUREMENT POINT
C output with 75 ohm loaded

ADJUSTMENT POINT
60h

SPECIFICATION
A=0.286 ±0.01Vp-p

DESCRIPTION
Adjust the data so the burst signal level is set to the specification shown above.

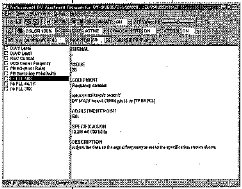
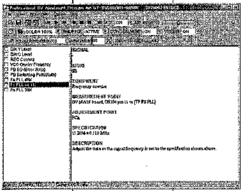
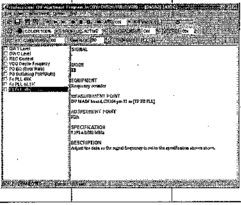
COM 2 CONNECTED

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure

3.7.10 Audio Circuit Adjustment

(Note)

- **Perform the audio circuitry adjustments immediately after turning the main unit ON. Be sure to turn the main unit OFF after completing each adjustment item.**

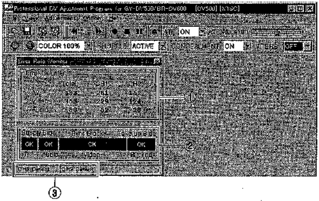
1	Fs PLL (48k) adjustment  SIGNAL MODE EE EQUIPMENT Frequency counter MEASUREMENT POINT DV MAIN board, CN104 pin 11 or [TP FS PLL] ADJUSTMENT POINT 62h SPECIFICATION 12.288 ±0.020 MHz DESCRIPTION Adjust the data so the signal frequency is set to the specification shown above.	• No signal • Frequency counter	EE	◎ TP FS PLL (connector cable) ① 62h ☆ 12.288 ± 0.020 MHz	(1) Click [Fs PLL (48k)]. (2) Click the [OK] button. (3) Adjust "New value" (address "62h") so that the frequency level becomes the adjustment level. (4) After adjustment, click the "v" marking and set the power button of the set to OFF.
2	Fs PLL (44.1k) adjustment  SIGNAL MODE EE EQUIPMENT Frequency counter MEASUREMENT POINT DV MAIN board, CN104 pin 11 or [TP FS PLL] ADJUSTMENT POINT FCh SPECIFICATION 11.2896 ±0.110 MHz DESCRIPTION Adjust the data so the signal frequency is set to the specification shown above.	• No signal • Frequency counter	EE	◎ TP FS PLL (connector cable) ① FCh ☆ 11.2896 ± 0.110 MHz	(1) Click [Fs PLL (44.1k)]. (2) Click the [OK] button. (3) Adjust "New value" (address "FCh") so that the frequency level becomes the adjustment level. (4) After adjustment, click the "v" marking and set the power button of the set to OFF.
3	Fs PLL (38k) adjustment  SIGNAL MODE EE EQUIPMENT Frequency counter MEASUREMENT POINT DV MAIN board, CN104 pin 11 or [TP FS PLL] ADJUSTMENT POINT FDh SPECIFICATION 8.192 ±0.080 MHz DESCRIPTION Adjust the data so the signal frequency is set to the specification shown above.	• No signal • Frequency counter	EE	◎ TP FS PLL (connector cable) ① FDh ☆ 8.192 ± 0.080 MHz	(1) Click [Fs PLL (38k)]. (2) Click the [OK] button. (3) Adjust "New value" (address "FDh") so that the frequency level becomes the adjustment level. (4) After adjustment, click the "v" marking and set the power button of the set to OFF.

3.7.11 Error Rate Monitoring

The error rate-monitoring screen is displayed when the PB EQ is adjusted or the error rate is measured. The screen shows the error rate every second during PB EQ adjustment. With the error rate measurement, it shows the error rate measurement result after about 20 seconds of measurement.

(1) Error Rate Monitoring

The following screen appears when [View] under the [Error Rate Monitor] tab is clicked.



Professional DV Adjustment Program for GY-DV550/BR-DV600 [DV500] [NTSC]
COLOR 100%
SHUFFLE ACTIVE
CONCEALMENT ON
①
②
③
OK

Fig. 3-7-12 (Error Rate Monitoring Screen)

① **Error rate display window**

Shows the error rate per video/audio or CH-1/CH-2 as well as the total error rate.

② **Sync block counter display window**

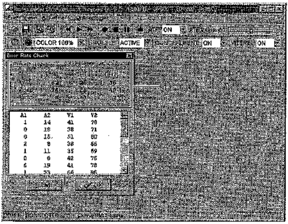
Shows the amount of sync blocks played by the head as a percentage. When it reaches 100%, "OK" is displayed and a graph is displayed bule. The error rates are measured when this display shows "OK".

③ **Error rate measurement status display window**

Depending on the load to the PC, "CH1 Reset" or "CH2 Reset" may be displayed frequently. In such a case, leave the PC idle (without operating the mouse, etc.). The error rates are measured when "Reset" is not displayed (when "CH1 Detect" or "CH2 Detect" is displayed).

(2) Error Rate Measurement

The following screen appears when [View] under the [Error Rate Check] tab is clicked. To start the measurement, click [Start] button. After a while the measurement result is displayed "①".

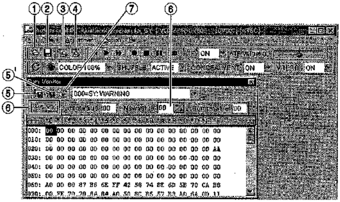


A1	A2	V1	V2
1	14	41	78
0	16	38	71
6	15	51	80
2	8	38	66
1	11	35	69
0	6	42	76
6	19	41	78

Fig. 3-7-13 (Error Rate Measurment)

3.7.12 ROM Tools

This section describes the seven functions of the ROM Tools in processing the EEPROM data.



000=SY:WARNING

New value 00

Comp. value 00

```
000: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
010: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
020: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 AA
030: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
040: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
050: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
060: A0 00 00 87 B6 6E FF 42 58 74 8E 6D 5B 70 CA B8
```

Fig. 3-7-14

① **File reading**

Read the ROM data saved in the PC files. It is provided as standard with the adjustment software, for use as initial data. When the PC files are read, the file names are displayed in the ROM file display window.

② **File saving**

The ROM data read by the ROM Tools can be saved in a PC file. This function is used for temporary backup of ROM data before adjustment. If the adjustment fails and the data becomes erroneous, use the backup to restore the original data.

③ **Data read from VCR**

The ROM data in the VCR can be read. The ROM file display window shows "Current VCR data" in this case.

④ **Data write in VCR**

The ROM data read by the ROM Tools can be written in the VCR. When the initial data is written, it is required to re-adjust the DV circuit and re-set the IEEE1394 ID (see 3.7.13).

⑤ **Data comparison**

Note: When the ROM data is written in the VCR, be sure to turn the main unit and adjustment software OFF once.

The ROM data read by the ROM Tools is compared with data contained in a PC file or with the VCR data, and any differences are displayed in red characters. "Comp. value" shows the data used in the comparison. It shows "(" when the comparison data does not exist. To cancel comparsion, clik ⑤'.

⑥ **Data editing**

The ROM data read by the ROM Tools can be edited on a per-address basis. To edit data, click the [New value] of the required address data. To write the data in the VCR, click the "V" marking. To cancel editting, click the "↶" marking.

⑦ **Data output**

The ROM data read by the ROM Tools can be output at a printer or as a text file.

3.7.13 IEEE1394 ID Setting

The GY-DV500 stores the ID in the format specified by the IEEE1394 standard in the EEPROM (IC103 on DV Main board). After replacing the EEPROM or the DV Main board, it is required to re-set the ID. The setting is possible with either of the methods outlined below.

1. Setting by manual input

(1) Under the [Option] tab of the adjustment software, click the [IEEE1394 ID Setting]. The window as shown below appears.

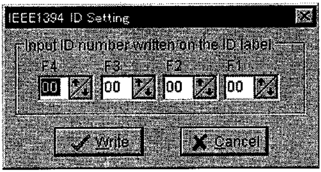


Fig. 3-7-15

(2) The ID ("ID : 0401xxxx" : NTSC, "ID : 0481xxxx" : PAL) is indicated on the ID label number attached to the DV Main board. Input characters corresponding to "0401xxxx" for NTSC or "0481xxxx" for PAL.

(3) Click "Write" to write the ID in the EEPROM.

2. Setting with ROM Tools

(1) Read the data saved in the EEPROM to be replaced. (See 3.7.12.③.)

(2) Save the read data in a PC file. (See 3.7.12.②.)

(3) After the EEPROM replacement, connect the adjustment software to the GY-DV500.

(4) Load the data saved in the PC file. (See 3.7.12.①.)

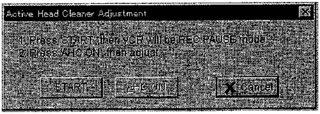
(5) Write the loaded data in the EEPROM. (See 3.7.12.④.)

(6) Now that the adjustment data in the new EEPROM has been overwritten by the data in the previous EEPROM. Re-adjust the DV circuit as required.

3.7.14 Active Head Cleaner Adjustment Mode

When adjusting the installation position of the active head cleaner, use this mode to force the active head cleaner ON for a certain period. (See subsection 2.7 No. 20 for the adjustment procedure.)

(1) Under the [Adjustment] tab, click [Active Head Cleaner Adjusting...]. The window as shown below appears.



1.Press 'START', then VCR will be REC PAUSE mode
2.Press 'AHC ON', then adjust

Fig. 3-7-16

(2) Click [START] to set to "REC PAUSE" mode.

(3) Click [ACH ON]. The active head cleaner will turn on in about 3 seconds.

(4) Adjust the installation position as described in the adjustment procedure.

SECTION 4
CHARTS AND DIAGRAMS

■ SCHEMATIC DIAGRAM NOTES

- **Schematic safety precaution**
  ⚠ Parts are safety related parts.
  When replacing them, be sure to use the specified parts.
- **Voltage and waveform measurements**
  Voltage: Measured with digital voltmeter in DC range; iris closed in REC mode.
  Value in ( ) is indicated only in the case PB voltage is different from that in REC mode.
  Waveform: Gray scale illuminated at more than 4000 lux at 3200K lighting.
- **Unit of value**
  Unless otherwise specified
  1) Resistance is in Ω (1/6 W)
  2) Capacitance is in µF
  3) Inductance is in µH

- **Expression of wiring**

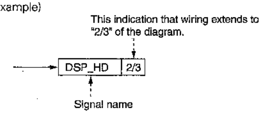
As the following circuit diagram is divided to print on some sheets, such an indication as the following is found in the case the wiring extends over two or more divided sections.

1) Circuit diagram divided into two or more sections:

Board	Board Name	Number of divided sections
15	CAM 1	1/2 – 2/2
16	CAM 2	1/3 –3/3
31	VIDEO/SYSCON	1/2 – 2/2
32	AUDIO/LCD	1/2 – 2/2
10	DV MAIN	1/7 – 7/7
—	OVERALL	1/2 – 2/2

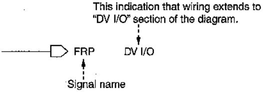
2) Indication of wiring which extends to another section:
(Example)

A)


This indication that wiring extends to "2/3" of the diagram.
DSP_HD
2/3
Signal name

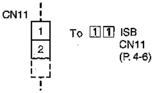
In the above case, the end of the wiring is connected to the "DSP_HD" on the 2nd section of the diagram.

B)


This indication that wiring extends to "DV I/O" section of the diagram.
FRP
DV I/O
Signal name

In the above case, the end of the wiring is connected to the "FRP" on the "DV I/O" section of the diagram.

- **Wiring of connector**
  (Example)



In the above example, CN11 is connected with CN11 on 11 ISB board.

- **Signal flow on the diagram**
  The following allow marks indicate the specified signal paths respectively.

➡ : Recording or EE signal path
⇨ : Playback signal ptah
➡ : Recording and Playback signal path

- **Others**

In regard of a board assembly whose circuit is composed of multilayered board patterns such 4- or 6-layered patterns, board patterns of the power supply lines and grounding lines are omitted in this section.

Note: For detail of each electrical part, refer to Section 6 "ELECTRICAL PARTS LIST" by it symbol number.

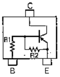
■ REPLACING SURFACE MOUNT "CHIP" COMPONENTS

- Some resistors, shorting jumpers (0 resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they are once removed.
- Chip resistors used in some circuits are of high precision type having little error in resistance.
  To demonstrate the full capacity of this set, place an order for proper parts referring to the diagrams and parts lists in the section 5.
- Soldering cautions:
  1) Do not apply heat for more than 3 seconds.
  2) Avoid using a rubbing stroke when soldering.
  3) Discard removed chips; do not reuse them.
  4) Supplementary cementing is not required.
  5) Use care not to scratch or otherwise damage the chips.

■ CHIP PARTS PIN ARRANGEMENT

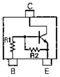
[1] Digital transistors

DTC 1 □□□□
① ②③



(Top view)

DTA 1 □□□□
DTB 1 □□□□
① ②③



(Top view)

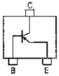
① Two digits show resistance of R1 in abbreviation.
43 : 4.7 kΩ
14 : 10 kΩ
24 : 22 kΩ
44 : 47 kΩ

② Roman letter show the resistive ratio between R1 and R2 in abbreviation.
E : R2/R1 = 1/1
Y : R2/R1 = 5/1
W : R2/R1 = 2/1
X : R2/R1 = 1/2
T : R2 is opened.

③ Symbol the shape of resistor in abbreviation.

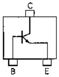
[2] Chip transistors and chip F.E.T.s

2SA □□□□
2SB □□□□



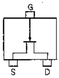
(Top view)

2SC □□□□
2SD □□□□



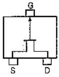
(Top view)

2SK □□□□



(Top view)

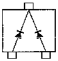
2SJ □□□□



(Top view)

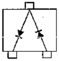
[3] Chip diodes

MA143A/MA742



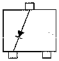
(Top view)

MA142WA



(Top view)

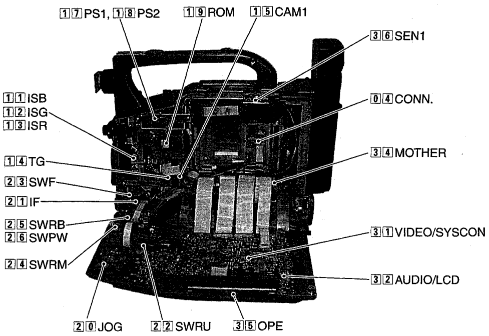
MA142A



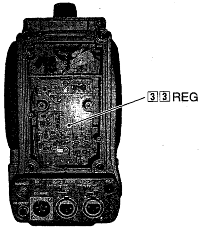
(Top view)

4.1 INDEX TO PAGES OF MAIN BOARDS AND CIRCUIT BOARD LOCATION

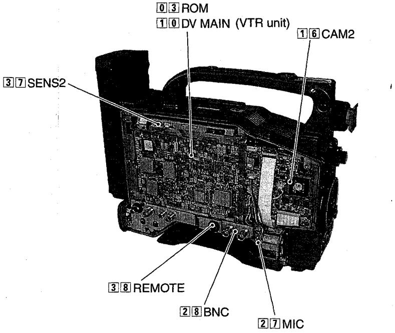
4.1.1 Circuit board location


17 PS1, 18 PS2
19 ROM
15 CAM1
36 SEN1
11 ISB
12 ISG
13 ISR
04 CONN.
34 MOTHER
14 TG
23 SWF
21 IF
25 SWRB
26 SWPW
31 VIDEO/SYSCON
24 SWRM
32 AUDIO/LCD
20 JOG
22 SWRU
35 OPE

Left side



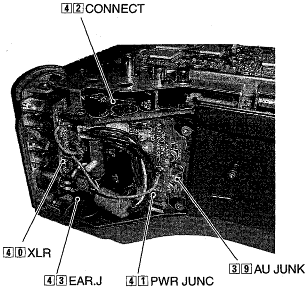
Rear


03 ROM
10 DV MAIN (VTR unit)
16 CAM2
37 SENS2
38 REMOTE
28 BNC
27 MIC

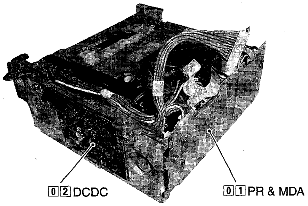
Right side

Board No.	Board Name	Page of diagram		
		Block diagram	Schematic diagram	Circuit board
—	OVERALL	—	4-4	—
—	OVERALL (VTR UNIT)	—	4-42	—
01	PR&MDA	4-66,67	4-52,53	4-54
02	DCDC		4-56	4-57
03	ROM		4-55	4-57
04	CONN.		4-55	4-57
10	DV MAIN	4-66,67	4-43 to 44	4-50,51
02	ISB	4-58	4-6	4-7
03	ISG			
04	ISR			
14	TG	4-58	4-8	4-9
15	CAM1	4-59	4-10,11	4-12,13
16	CAM2	4-60	4-14 to 16	4-17,18
17	PS1	—	4-19	4-21
18	PS2	—	4-20	4-21
19	ROM	4-59	4-22	4-23
20	JOG		4-24	4-26
21	IF	4-61	4-22	4-23
22	SWRU	4-61	4-24	4-26
23	SWF	4-61	4-25	4-26
24	SWRM	—	4-25	4-26
25	SWRB	—	4-25	4-26
26	SWPW	—	4-25	4-26
27	MIC	—	4-25	4-26
28	BNC	—	4-25	4-26
29	FL	—	–	4-26
31	VIDEO/SYSCON	4-62,64	4-27,28	4-29
32	AUDIO/LCD	4-63,65	4-30,31	4-32,33

Board No.	Board Name	Page of diagram		
		Block diagram	Schematic diagram	Circuit board
33	REG	4-64	4-34	4-35
34	MOTHER	—	4-36	4-37
35	OPE		4-39	4-41
36	SEN1		4-40	4-41
37	SENS2		4-40	4-42
38	REMOTE		4-40	4-41
39	AU JUNK		4-38	4-37
40	XLR		4-40	4-41
41	PWR JUNC		4-39	4-41
42	CONNECT		4-40	4-41
43	EAR.J		4-40	4-41

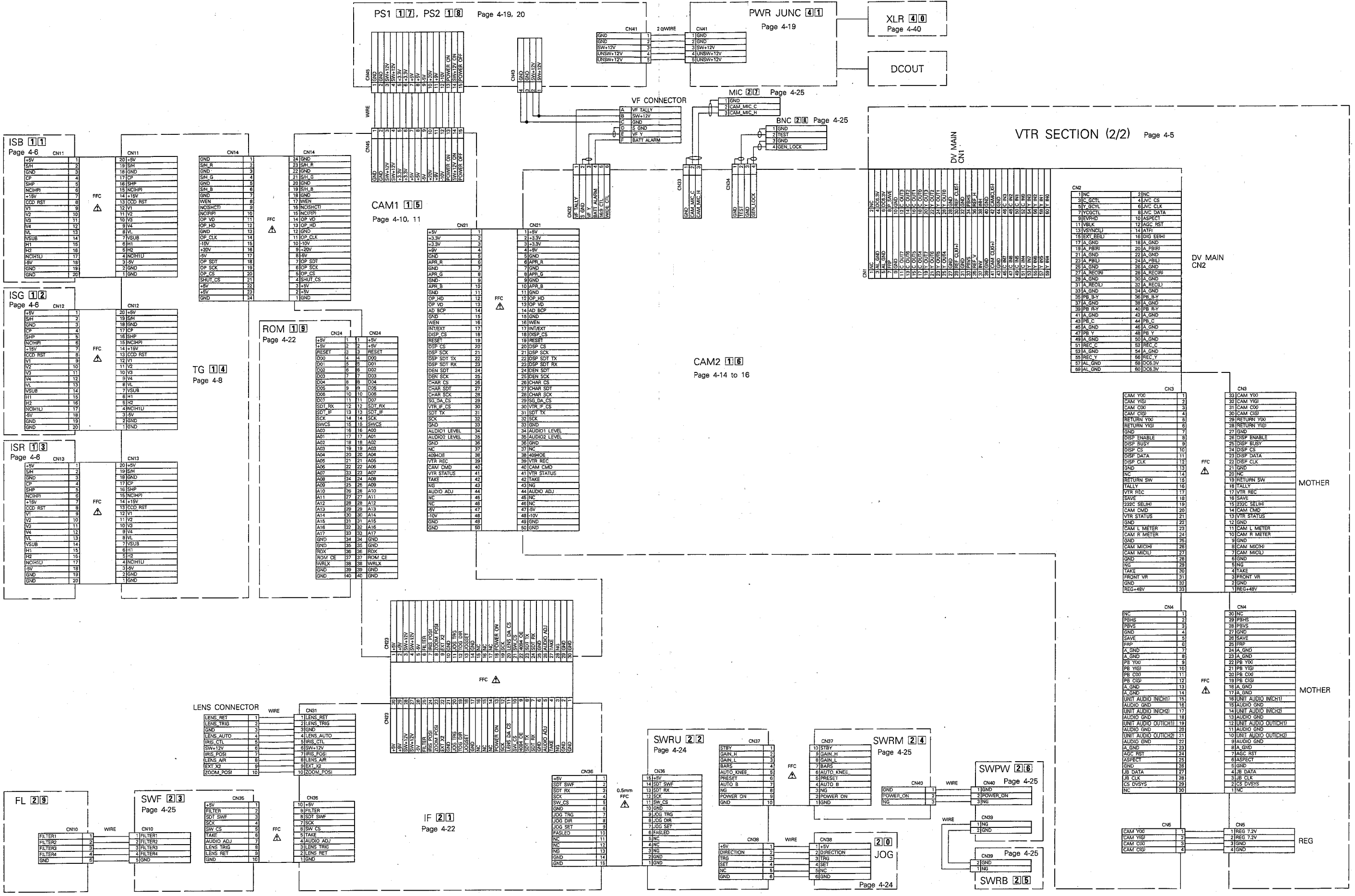

42 CONNECT
40 XLR
43 EAR.J
41 PWR JUNC
39 AU JUNK

Bottom

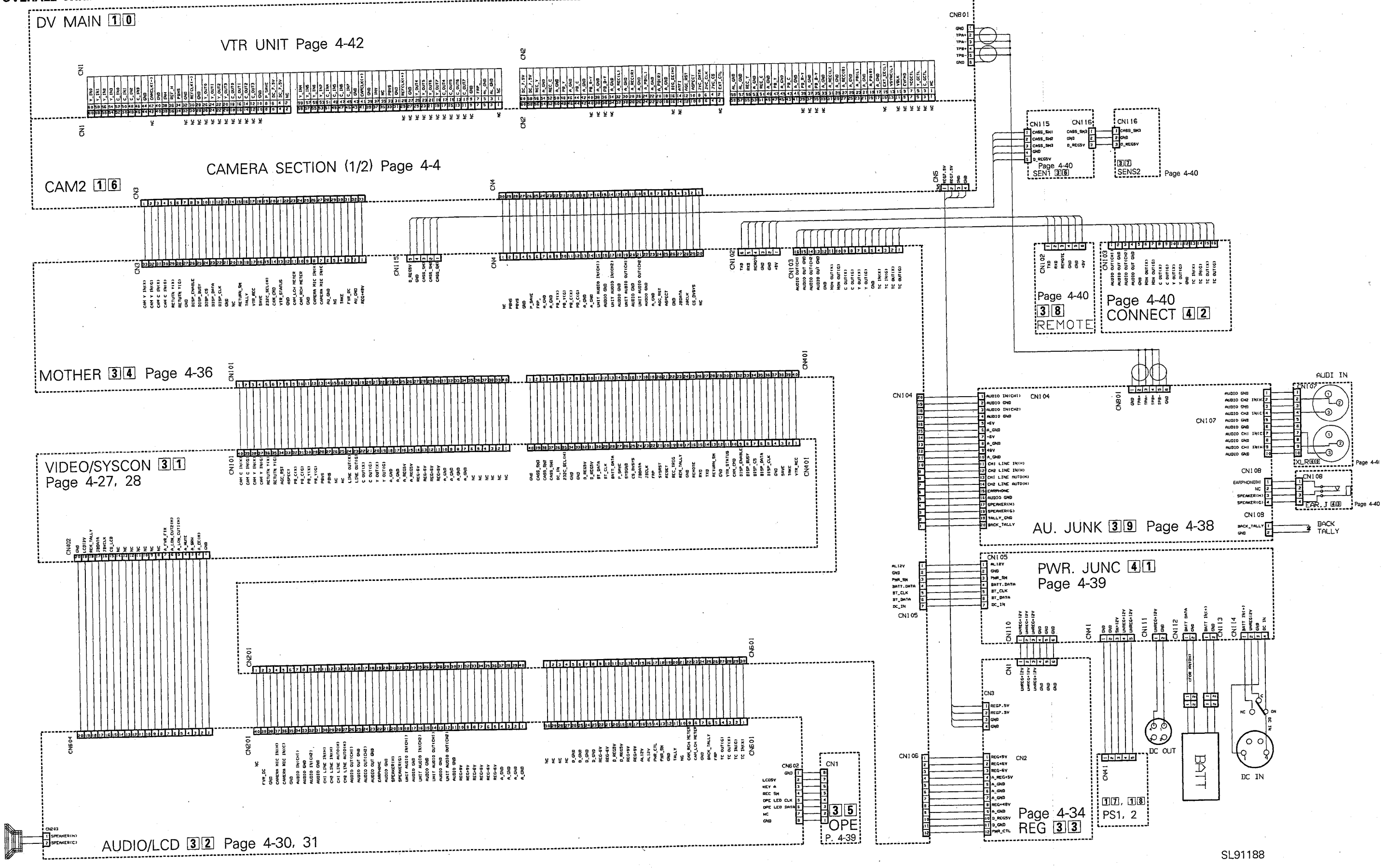

02 DCDC
01 PR & MDA

VTR unit

4.2 OVERALL WIRING DIAGRAM (1/2)


PS1 17, PS2 18 Page 4-19, 20
PWR JUNC 41 Page 4-19
XLR 40 Page 4-40
DCOUT
VF CONNECTOR
MIC 27 Page 4-25
BNC 28 Page 4-25
VTR SECTION (2/2) Page 4-5
DV MAIN CN1
DV MAIN CN2
ISB 11 Page 4-6
ISG 12 Page 4-6
ISR 13 Page 4-6
TG 14 Page 4-8
CAM1 15 Page 4-10, 11
ROM 19 Page 4-22
CAM2 16 Page 4-14 to 16
MOTHER
MOTHER
REG
LENS CONNECTOR
FL 29
SWF 23 Page 4-25
IF 21 Page 4-22
SWRU 22 Page 4-24
SWRM 24 Page 4-25
SWPW 26 Page 4-25
JOG 20 Page 4-24
SWRB 25 Page 4-25
FFC
WIRE
2 Q'WIRE
0.5mm FFC

• OVERALL WIRING DIAGRAM (2/2)


DV MAIN 10
VTR UNIT Page 4-42
CN1
CN2
CN801
CAM2 16
CAMERA SECTION (1/2) Page 4-4
CN3
CN4
CN5
CN115
CN116
Page 4-40
SEN1 36
37
SENS2
Page 4-40
CN115
CN102
CN103
Page 4-40
38
REMOTE
Page 4-40
CONNECT 42
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CN401
VIDEO/SYSCON 31
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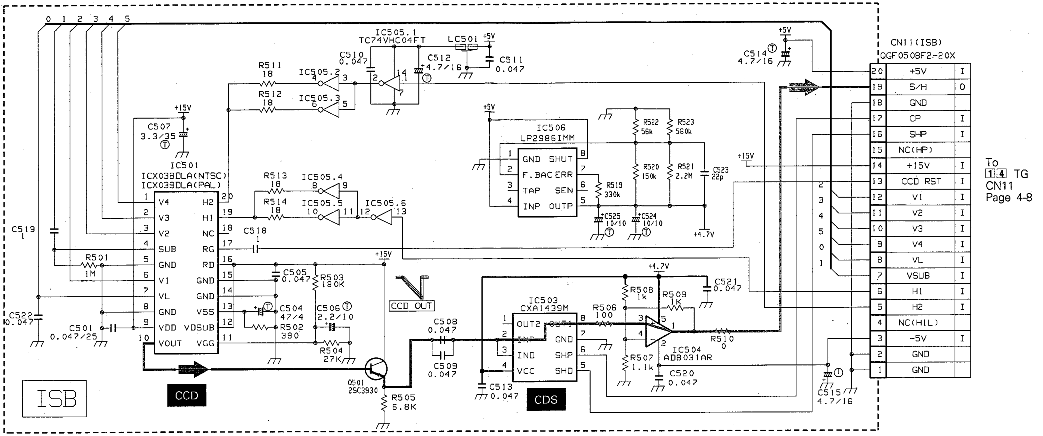
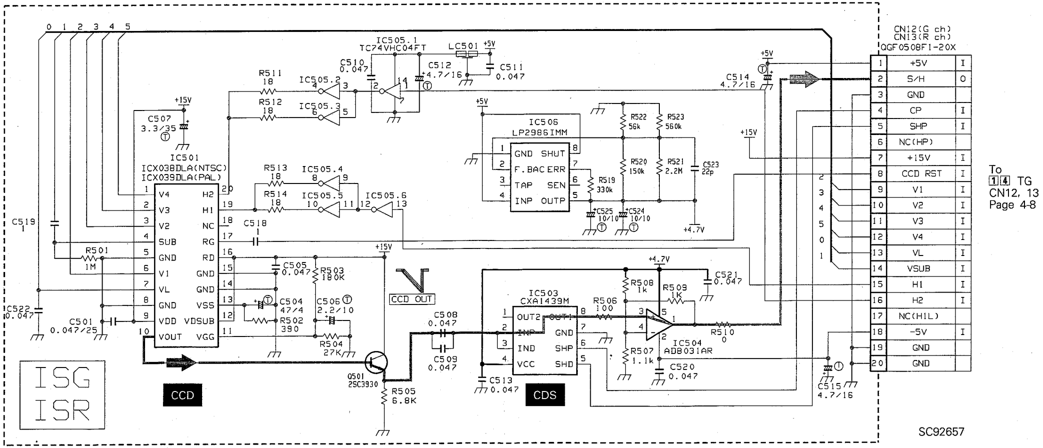
CN101
CN401
CN402
CN104
CN104
CN801
AUDI IN
CN107
CN107
XLR
Page 4-41
CN108
CN108
EAR. J
Page 4-40
CN109
BACK TALLY
AU. JUNK 39 Page 4-38
CN105
PWR. JUNC 41
Page 4-39
CN105
CN110
CN41
CN111
CN112
CN113
CN114
CN201
CN501
CN1
CN3
CN604
CN201
CN501
CN602
CN1
35
OPE
P. 4-39
CN106
CN2
Page 4-34
REG 33
CN41
17, 18
PS1, 2
DC OUT
BATT
DC IN
CN203
AUDIO/LCD 32 Page 4-30, 31
SL91188

4.3 ISB/ISG/ISR SCHEMATIC DIAGRAM 11/12/13

· ISB


IC505.1 TC74VHC04FT
LC501
C510 0.047
C512 4.7/16
C511 0.047
C514 4.7/16
R511 18
R512 18
IC505.2
IC505.3
C507 3.3/35
IC501 ICX038DLA(NTSC) ICX039DLA(PAL)
V4 V3 V2 SUB GND V1 VL GND VDD VOUT
H2 H1 NC RG RD GND GND VSS VDSUB VGG
R513 18
R514 18
IC505.4
IC505.5
IC505.6
C518 1
C519 1
R501 1M
C522 0.047
C501 0.047/25
C505 0.047
R503 180K
C504 47/4
C506 2.2/10
R502 390
R504 27K
Q501 2SC3930
R505 6.8K
CCD OUT
CCD
IC506 LP2986IMM
GND SHUT F.BAC ERR TAP SEN INP OUTP
R522 56k
R523 560k
R520 150k
R521 2.2M
C523 22p
R519 330k
C525 10/10
C524 10/10
IC503 CXA1439M
OUT2 OUT1 INP GND IND SHP VCC SHD
C508 0.047
C509 0.047
C513 0.047
CDS
R508 1k
R509 1K
R506 100
C521 0.047
IC504 AD8031AR
R507 1.1k
R510 0
C520 0.047
C515 4.7/16
CN11(ISB) QGF0508F2-20X
20 +5V I
19 S/H O
18 GND
17 CP I
16 SHP I
15 NC(HP)
14 +15V I
13 CCD RST I
12 V1 I
11 V2 I
10 V3 I
9 V4 I
8 VL I
7 VSUB I
6 H1 I
5 H2 I
4 NC(H1L)
3 -5V I
2 GND
1 GND
To 14 TG CN11 Page 4-8
ISB

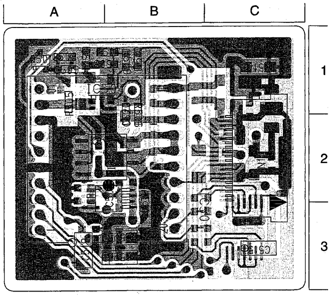
· ISG/ISR


IC505.1 TC74VHC04FT
LC501
C510 0.047
C512 4.7/16
C511 0.047
C514 4.7/16
R511 18
R512 18
C507 3.3/35
IC501 ICX038DLA(NTSC) ICX039DLA(PAL)
R513 18
R514 18
C518 1
C519 1
R501 1M
C522 0.047
C501 0.047/25
C505 0.047
R503 180K
C504 47/4
C506 2.2/10
R502 390
R504 27K
Q501 2SC3930
R505 6.8K
CCD OUT
CCD
IC506 LP2986IMM
IC503 CXA1439M
IC504 AD8031AR
CDS
CN12(G ch) CN13(R ch) QGF0508F1-20X
1 +5V I
2 S/H O
3 GND
4 CP I
5 SHP I
6 NC(HP)
7 +15V I
8 CCD RST I
9 V1 I
10 V2 I
11 V3 I
12 V4 I
13 VL I
14 VSUB I
15 H1 I
16 H2 I
17 NC(H1L)
18 -5V I
19 GND
20 GND
To 14 TG CN12, 13 Page 4-8
ISG ISR
SC92657

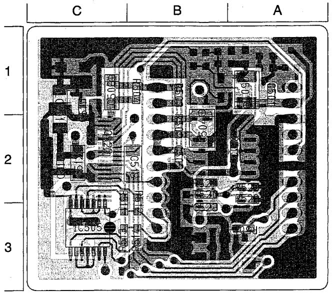
4.4 ISB/ISG/ISR CIRCUIT BOARD

· ISB

– SIDE A –



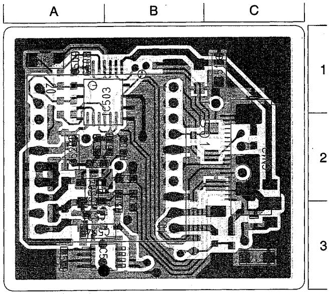
– SIDE B –



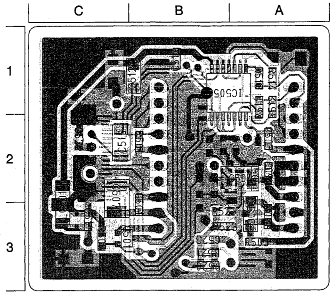
SC82604-02-002

· ISG

– SIDE A –



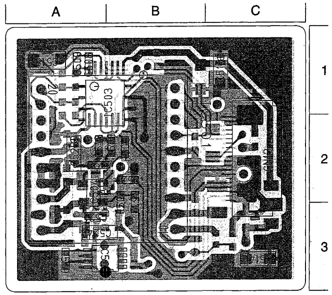
– SIDE B –



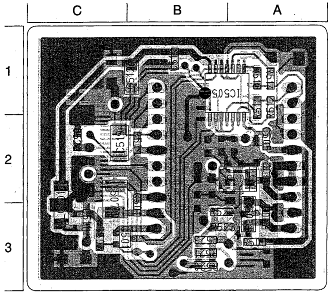
SC82604-03-002

· ISR

– SIDE A –



– SIDE B –



SC82604-04-002

● ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.

A-1C
Side — Y axis
X axis

IC501	A-2B	R505	A-1A	R521	B-2B	C511	B-1C	C525	A-3B
IC503	A-2B	R506	A-1B	R522	B-2A	C512	B-2C		
IC504	A-1B	R507	A-1B	R523	B-2A	C513	B-2A	CN11	A-2C
IC505	B-2C	R508	A-1B			C514	A-1C		
IC506	A-2B	R509	A-1B	C501	B-1A	C515	A-3C	LC501	B-1C
		R510	A-1B	C504	B-1B	C518	B-2C		
Q501	A-1A	R511	B-2C	C505	B-2B	C519	A-3A		
		R512	B-2C	C506	B-1C	C520	A-1B		
R501	B-3A	R513	B-3C	C507	B-1A	C521	A-1A		
R502	B-1B	R514	B-3C	C508	A-1A	C522	B-2C		
R503	B-1B	R519	A-2B	C509	A-1A	C523	B-2B		
R504	B-1C	R520	B-2B	C510	B-2C	C524	A-3B		

● ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.

A-1C
Side — Y axis
X axis

IC501	A-2B	R505	B-3C	R521	B-3B	C511	B-2C	C525	A-2A
IC503	A-1B	R506	A-2B	R522	B-2B	C512	B-1C		
IC504	A-2A	R507	A-2A	R523	B-2B	C513	A-2A	CN12	A-2D
IC505	B-1B	R508	A-2B			C514	A-3C		
IC506	A-3B	R509	A-2B	C501	B-2C	C515	A-1C	LC501	B-2C
		R510	A-2B	C504	B-2A	C518	A-1A		
Q501	B-3C	R511	B-1A	C505	B-2A	C519	B-2C		
		R512	B-1A	C506	B-2A	C520	A-2B		
R501	B-2C	R513	B-1A	C507	B-2C	C521	A-2A		
R502	B-2A	R514	B-1A	C508	A-1A	C522	B-2C		
R503	B-3A	R519	A-3A	C509	A-1A	C523	B-3B		
R504	B-2A	R520	B-3B	C510	B-1B	C524	A-3A		

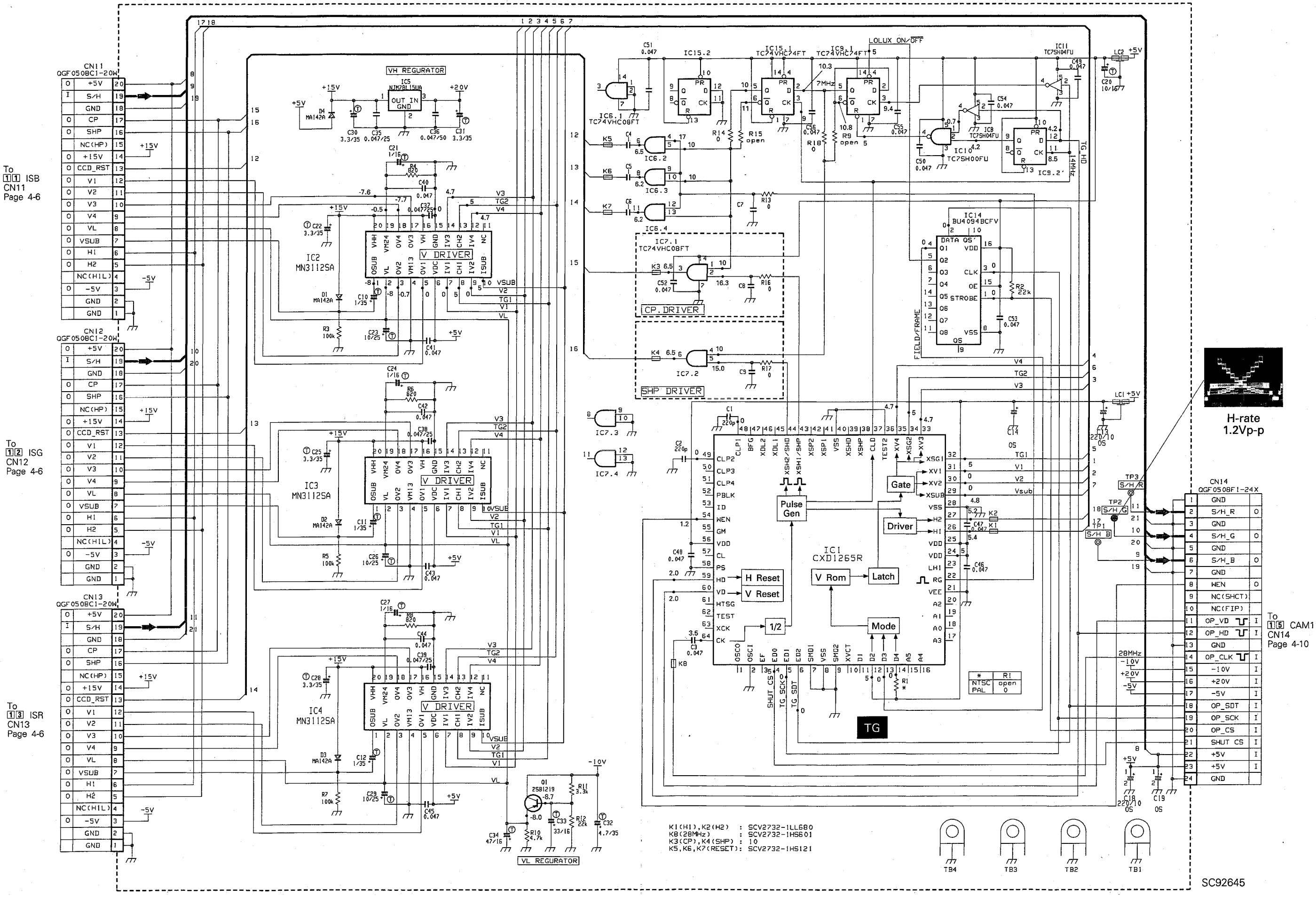
● ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.

A-1C
Side — Y axis
X axis

IC505	B-1B	R523	B-2B	R507	A-2A	C521	A-2A	C525	A-2A
				R511	B-1A	C522	B-2C	C524	A-3A
IC506	A-3B	R503	B-3A	R506	A-2B			C518	A-1A
IC503	A-1B			R512	B-1A	C523	B-3B	C519	B-2C
		R513	B-1A	R505	B-3C	C520	A-2B		
IC504	A-2A			R504	B-2A	C508	A-1A	C501	B-2C
		R502	B-2A					C505	B-2A
IC501	A-2B	R510	A-2B	R519	A-3A	C504	B-2A		
		R501	B-2C	R520	B-3B	C507	B-2C	C513	A-2A
Q501	B-3C	R514	B-1A			C514	A-3C		
		R509	A-2B	C509	A-1A	C512	B-1C	LC501	B-2C
R521	B-3B			C510	B-1B	C506	B-2A		
R522	B-2B	R508	A-2B	C511	B-2C	C515	A-1C	CN13	A-2D

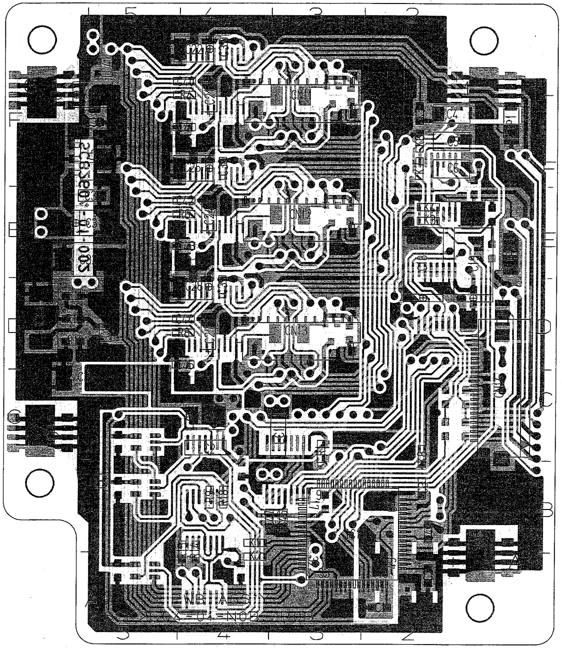
4.5 TG(Timing Generator) SCHEMATIC DIAGRAM 1 4


CN11 QGF0508C1-20W
+5V
S/H
GND
CP
SHP
NC(HP)
+15V
CCD_RST
V1
V2
V3
V4
VL
VSUB
H1
H2
NC(H1L)
-5V
To 11 ISB CN11 Page 4-6
CN12 QGF0508C1-20W
To 12 ISG CN12 Page 4-6
CN13 QGF0508C1-20W
To 13 ISR CN13 Page 4-6
VH REGURATOR
IC5 NJM78L15UA
OUT IN GND
D4 MA142A
C30 3.3/35
C35 0.047/25
C36 0.047/50
C31 3.3/35
IC2 MN3112SA
IC3 MN3112SA
IC4 MN3112SA
V DRIVER
VHH VM24 OV4 OV3 VH GND IV3 CH2 IV4 NC
OSUB VL OV2 VM13 OV1 VDC IV1 CH1 IV2 ISUB
D1 MA142A
D2 MA142A
D3 MA142A
R3 100k
R5 100k
R7 100k
R4 820
R6 820
R8 820
C22 3.3/35
C25 3.3/35
C28 3.3/35
C10 1/35
C11 1/35
C12 1/35
C23 10/25
C26 10/25
C29 10/25
C41 0.047
C43 0.047
C45 0.047
VL REGURATOR
Q1 2SB1219
R10 4.7k
R11 3.3k
R12 22k
C33 33/16
C32 4.7/35
C34 47/16
-10V
IC6.1 TC74VHC08FT
IC6.2
IC6.3
IC6.4
IC15.2
IC15.1 TC74VHC74FT
IC9.1 TC74VHC74FT
LOLUX ON/OFF
IC11 TC7SH04FU
IC8 TC7SH04FU
IC10 TC7SH00FU
IC5.2'
7MHz
14MHz
TG HD
R14 0
R15 open
R18 0
R9 open
R13 0
IC7.1 TC74VHC08FT
CP.DRIVER
IC7.2
SHP DRIVER
IC7.3
IC7.4
K3 K4 K5 K6 K7
IC14 BU4094BCFV
DATA QS' Q1 VDD Q2 Q3 CLK Q4 OE Q5 STROBE Q6 Q7 Q8 VSS QS
FIELD/FRAME
R2 22k
C53 0.047
IC1 CXD1265R
CLP1 BFG XDL2 XDL1 XSH2/SHD XSH1/SHP XSP2 XSP1 VSS XSHD XSHP CLD TEST2 XV4 XSG2 XV3
CLP2 CLP3 CLP4 PBLK ID WEN GM VDD CL PS HD VD HTSG TEST XCK CK
XSG1 XV1 XV2 XSUB VSS H2 H1 VDD VDD LH1 RG VEE A2 A1 A0 A3
OSCO OSCI EF ED0 ED1 ED2 SMD1 VSS SMD2 XVCT D1 D2 D3 D4 A5 A4
Pulse Gen
Gate
Driver
H Reset
V Reset
1/2
V Rom
Latch
Mode
SHUT CS
TG SCK
TG SDT
K8
TG
* R1
NTSC open
PAL 0
H-rate 1.2Vp-p
TP1 S/H_B
TP2 S/H_G
TP3 S/H_R
LC1 +5V
LC2 +5V
28MHz
CN14 QGF0508F1-24X
GND
S/H_R
S/H_G
S/H_B
WEN
NC(SHCT)
NC(FIP)
OP_VD
OP_HD
OP_CLK
-10V
+20V
-5V
OP_SDT
OP_SCK
OP_CS
SHUT CS
+5V
To 15 CAM1 CN14 Page 4-10
K1(H1),K2(H2) : SCV2732-1LL680
K8(28MHz) : SCV2732-1HS601
K3(CP),K4(SHP) : 10
K5,K6,K7(RESET): SCV2732-1HS121
TB4
TB3
TB2
TB1

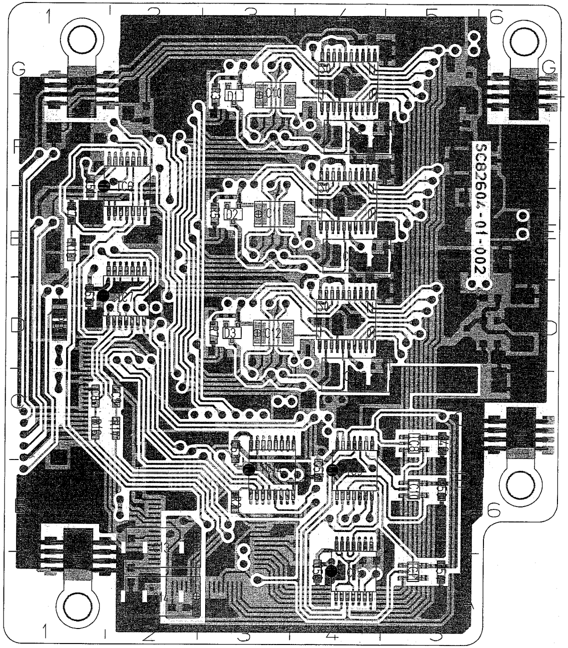
SC92645

4.6 TG CIRCUIT BOARD

– SIDE A –



– SIDE B –

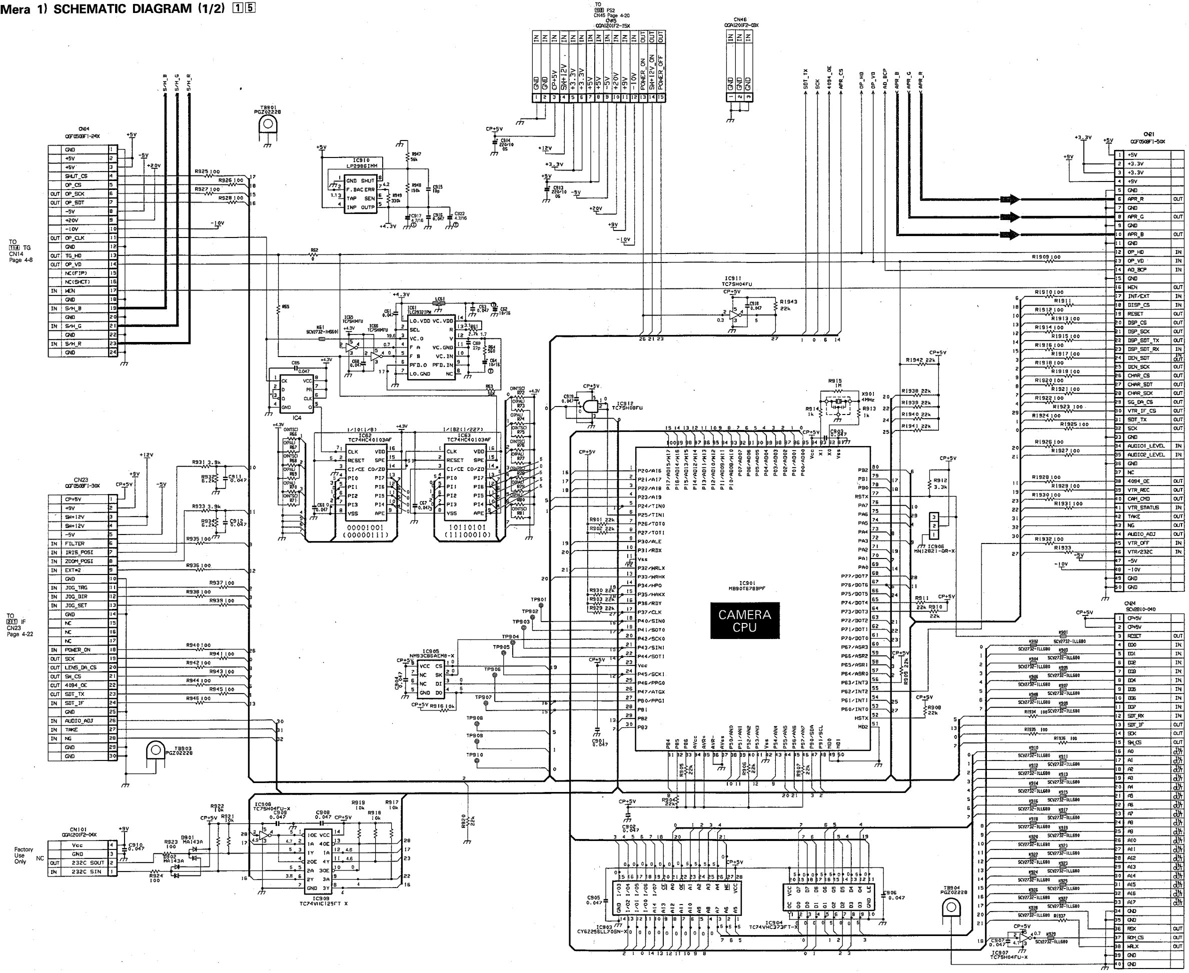


● **ADDRESS TABLE OF BOARD PARTS**
Each address may have an address error by one interval.

A-1C
Side — Y axis
X axis

IC1	A-3B	R3	B-3G	C7	B-1E	C33	A-6D	C56	B-4A	TB1	B-6B
IC2	B-4G	R4	A-5G	C8	B-2C	C34	A-6C			TB2	B-6G
IC3	B-4E	R5	B-3E	C9	B-2C	C35	A-6F	TP1	A-1F	TB3	B-1G
IC4	B-4D	R6	A-5E	C10	B-3G	C36	A-6E	TP2	A-1E	TB4	B-1A
IC5	A-6F	R7	B-3D	C11	B-3E	C37	A-4G	TP3	B-1D		
IC6	B-2F	R8	A-5D	C12	B-3D	C38	A-4F				
IC7	B-2D	R9	A-4B	C13	B-2B	C39	A-4D	CN11	A-3G		
IC8	B-5C	R10	A-6D	C14	B-2A	C40	A-5G	CN12	A-3E		
IC9	B-4B	R11	A-6D	C18	A-2E	C41	A-5F	CN13	A-3D		
IC10	B-5B	R12	A-6D	C19	A-1E	C42	A-5E	CN14	A-1C		
IC11	B-5A	R13	B-1E	C20	A-4C	C43	A-5E				
IC14	B-3B	R14	A-4B	C21	A-4F	C44	A-5D	K1	A-4B		
IC15	B-4A	R15	A-5B	C22	A-5G	C45	A-5D	K2	A-4A		
		R16	B-2C	C23	B-4F	C46	A-4B	K3	A-2E		
Q1	A-5D	R17	B-2C	C24	A-4E	C47	A-4B	K4	A-2E		
		R18	A-4B	C25	A-5F	C48	A-2B	K5	A-2F		
D1	B-3G			C26	B-4E	C49	B-5C	K6	A-2F		
D2	B-3E	C1	A-2A	C27	A-4D	C50	B-5B	K7	A-2F		
D3	B-3D	C2	A-2A	C28	A-5D	C51	B-1F	K8	A-2C		
D4	A-5G	C3	A-2B	C29	B-4C	C52	B-1D				
		C4	A-2F	C30	A-6G	C53	B-3C	LC1	A-4C		
R1	A-3C	C5	A-2F	C31	A-6E	C54	B-5A	LC2	A-4C		
R2	B-3B	C6	A-2F	C32	A-6E	C55	B-4B				

4.7 CAM1(CAMera 1) SCHEMATIC DIAGRAM (1/2) 15


CAMERA CPU
IC901 MB90T678BPF
CN04 QGF0508F1-24X
TO 14 TG CN14 Page 4-8
CN23 QGF0508F1-30X
TO 11 IF CN23 Page 4-22
CN45 QGA1201F2-15X
TO 10 PS2 CN45 Page 4-20
CN46 QGA1201F2-03X
CN21 QGF0508F1-50X
TO 18 CAM2 CN21 Page 4-14
CN24 SCV2810-040
TO 13 ROM CN24 Page 4-22
CN101 QGA1201F2-04X
Factory Use Only
NC
IC910 LP2986IMM
IC61 TLC2932IPW
IC62 TC74HC40103AF
IC63 TC74HC40103AF
IC4
IC65 TC7SH04FU
IC66 TC7SH04FU
IC905 NM93C86AEM8-X
IC906 MN12821-QR-X
IC907 TC7SH04FU-X
IC908 TC7SH04FU-X
IC909 TC74VHC125FT X
IC911 TC7SH04FU
IC912 TC7SH08FU
IC903 CY62256LL70SN-X
IC904 TC74VHC373FT-X
X901 4MHz
D901 MA143A
D902 MA143A
TB901 PGZ0222B
TB903 PGZ0222B
TB904 PGZ0222B
S/H_B
S/H_G
S/H_R
SDT_TX
SCK
4094_OE
APR_CS
OP_HD
OP_VD
AD_BCP
APR_B
APR_G
APR_R
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10110101 (11100010)

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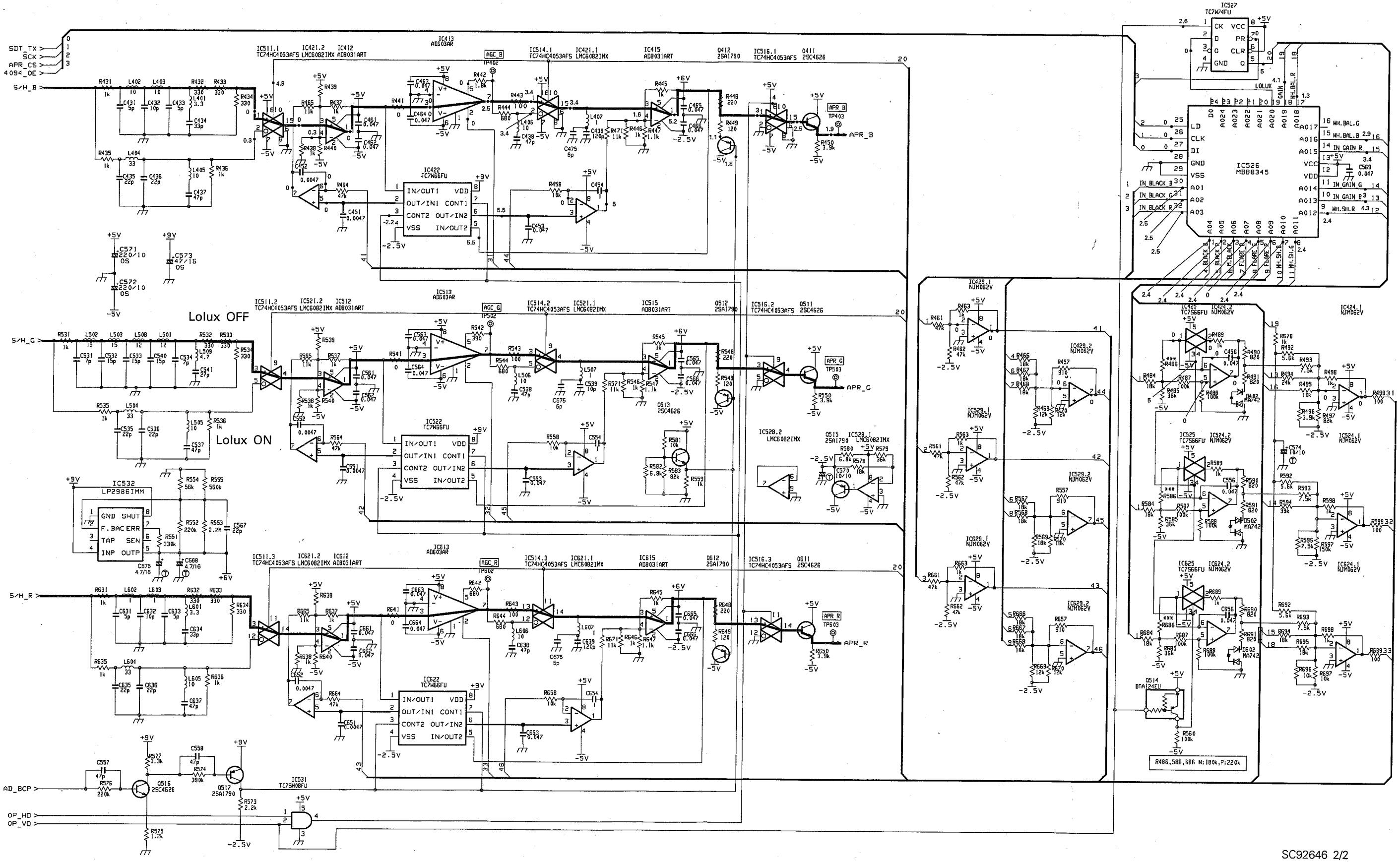
· CAM1 SCHEMATIC DIAGRAM (2/2) 15



SDT_TX
SCK
APR_CS
4094_OE
S/H_B
S/H_G
S/H_R
AD_BCP
OP_HD
OP_VD
APR_B
APR_G
APR_R
AGC_B
AGC_G
AGC_R
TP402
TP403
TP502
TP503
TP602
TP603
IC511.1 TC74HC4053AFS
IC421.2 LMC6082IMX
IC412 AD8031ART
IC413 AD603AR
IC514.1 TC74HC4053AFS
IC421.1 LMC6082IMX
IC415 AD8031ART
Q412 2SA1790
IC516.1 TC74HC4053AFS
Q411 2SC4626
IC422 TC7W66FU
IN/OUT1
OUT/IN1
CONT2
VSS
VDD
CONT1
OUT/IN2
IN/OUT2
IC511.2 TC74HC4053AFS
IC521.2 LMC6082IMX
IC512 AD8031ART
IC513 AD603AR
IC514.2 TC74HC4053AFS
IC521.1 LMC6082IMX
IC515 AD8031ART
Q512 2SA1790
IC516.2 TC74HC4053AFS
Q511 2SC4626
IC522 TC7W66FU
Lolux OFF
Lolux ON
Q513 2SC4626
IC528.2 LMC6082IMX
Q515 2SA1790
IC528.1 LMC6082IMX
IC532 LP2986IMM
GND
SHUT
F.BAC
ERR
TAP
SEN
INP
OUTP
IC511.3 TC74HC4053AFS
IC621.2 LMC6082IMX
IC612 AD8031ART
IC613 AD603AR
IC514.3 TC74HC4053AFS
IC621.1 LMC6082IMX
IC615 AD8031ART
Q612 2SA1790
IC516.3 TC74HC4053AFS
Q611 2SC4626
IC622 TC7W66FU
Q516 2SC4626
Q517 2SA1790
IC531 TC7SH08FU
IC527 TC7W74FU
CK
VCC
D
PR
Q
CLR
GND
LOLUX
IC526 MB88345
LD
CLK
DI
GND
VSS
AO1
AO2
AO3
AO17
AO16
AO15
VCC
VDD
AO14
AO13
AO12
WH.BAL.G
WH.BAL.B
IN GAIN R
IN GAIN G
IN GAIN B
WH.SH.R
IN BLACK B
IN BLACK G
IN BLACK R
IC429.1 NJM062V
IC429.2 NJM062V
IC529.1 NJM062V
IC529.2 NJM062V
IC629.1 NJM062V
IC629.2 NJM062V
IC425 TC7S66FU
IC424.2 NJM062V
IC424.1 NJM062V
IC525 TC7S66FU
IC524.2 NJM062V
IC524.1 NJM062V
IC625 TC7S66FU
IC624.2 NJM062V
IC624.1 NJM062V
D402 MA742
D502 MA742
D602 MA742
Q514 DTA124EU
R486,586,686 N:180k,P:220k
+5V
-5V
+9V
+6V
-2.5V

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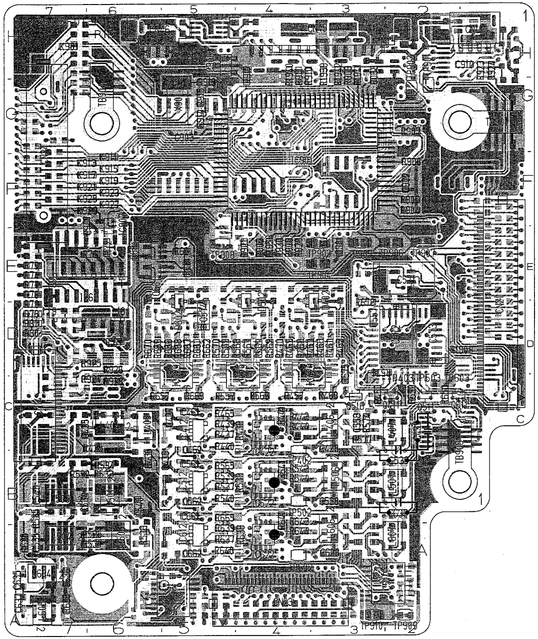
4.8 CAM1 CIRCUIT BOARD

– SIDE A –



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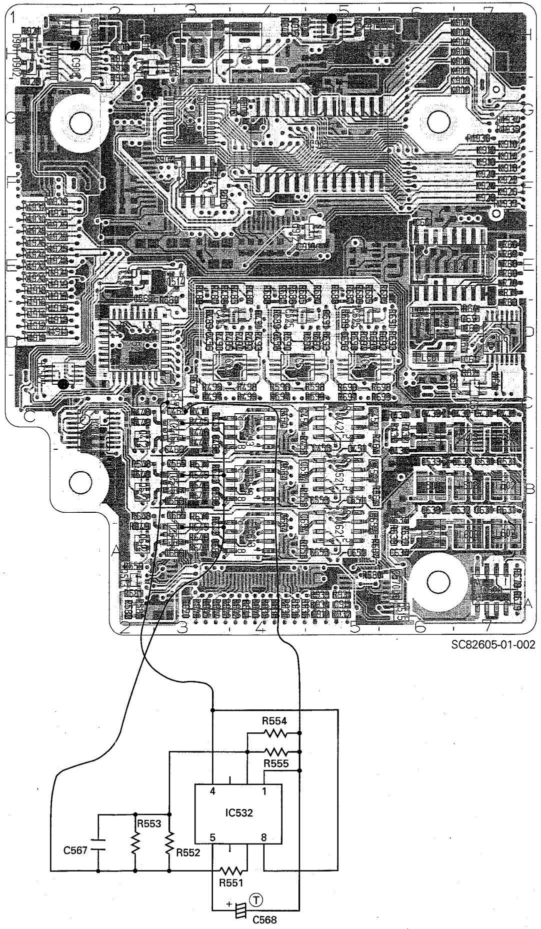

● **ADDRESS TABLE OF BOARD PARTS**

Each address may have an address error by one interval.

```
     A-1C
Side ─┘│└──Y axis
       └───X axis
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IC61	B-7D	R61	B-7D	R496	B-3D	R634	B-6B
IC62	B-6E	R62	A-5E	R497	B-3C	R635	A-7B
IC63	A-6E	R63	B-7E	R498	B-4D	R636	A-7A
IC64	B-7D	R64	B-7E	R499	B-4C	R637	A-5B
IC65	A-6E	R65	A-5E	R531	B-7C	R638	A-4B
IC66	A-6E	R66	B-7E	R532	A-7B	R639	A-5B
IC412	A-5C	R67	B-7E	R533	A-6B	R640	A-5B
IC413	B-4C	R68	B-7E	R534	A-6C	R641	A-4B
IC415	B-3C	R69	B-7E	R535	A-7B	R642	B-3B
IC421	B-5C	R70	B-7E	R536	A-6B	R643	A-4B
IC422	A-4C	R71	B-7E	R537	A-5B	R644	A-4B
IC424	B-3D	R72	A-6E	R538	A-4B	R645	B-3B
IC425	B-4E	R73	A-6E	R539	A-5B	R646	B-3B
IC429	A-4D	R74	A-7E	R540	A-5B	R647	B-3B
IC511	A-5A	R75	A-7E	R541	A-4C	R648	B-2B
IC512	A-5B	R76	A-7E	R542	B-3B	R649	B-2B
IC513	B-4B	R77	A-7E	R543	A-4C	R650	A-2D
IC514	A-2A	R78	A-7E	R544	A-4B	R657	A-6D
IC515	B-3B	R79	A-7E	R545	B-3B	R658	B-4B
IC516	B-2C	R80	A-7D	R546	B-3B	R661	A-5D
IC521	B-5C	R81	A-7D	R547	B-3B	R662	A-5D
IC522	A-4B	R82	B-7D	R548	B-2C	R663	A-5D
IC524	B-4D	R431	B-7C	R549	B-2B	R664	B-5B
IC525	B-4E	R432	B-6C	R550	A-2D	R665	A-5B
IC526	B-2D	R433	B-6C	R557	A-5D	R666	A-5D
IC527	B-1D	R434	B-6C	R558	B-4B	R667	A-5D
IC528	B-7A	R435	A-6C	R559	B-2A	R668	A-5D
IC529	A-4D	R436	A-6C	R560	B-3E	R669	A-6D
IC531	B-2E	R437	A-5C	R561	A-4D	R670	A-6D
IC612	A-5B	R438	A-4C	R562	A-4D	R671	B-3B
IC613	B-4B	R439	A-5C	R563	A-4D	R678	A-3E
IC615	B-3B	R440	A-5C	R564	B-5B	R684	B-6E
IC621	B-5B	R441	A-4C	R565	A-5C	R685	B-5E
IC622	A-4B	R442	B-3C	R567	A-4D	R686	B-5E
IC624	B-5D	R443	A-4C	R568	A-4D	R687	B-5E
IC625	B-5E	R444	A-4C	R569	A-5D	R688	B-5E
IC629	A-5D	R445	B-3C	R570	A-5D	R689	B-5D
IC901	A-4G	R446	B-3C	R571	B-3C	R690	B-5D
IC903	B-5G	R447	B-3C	R573	B-3D	R691	B-6D
IC904	B-3G	R448	B-2C	R574	A-3C	R692	B-6D
IC905	B-3F	R449	B-2C	R575	A-3D	R693	B-6D
IC906	A-5H	R450	A-3D	R576	A-3D	R694	B-5D
IC907	A-6F	R457	A-4D	R577	A-3C	R695	B-5D
IC908	B-1H	R458	B-4C	R578	B-7A	R696	B-5D
IC909	B-1H	R461	A-3D	R579	B-7A	R697	B-5C
IC910	B-5H	R462	A-3D	R580	B-5A	R698	B-6D
IC911	B-2H	R463	A-3D	R581	B-2A	R699	B-6C
IC912	B-5F	R464	B-5C	R582	B-2A	R901	A-4E
		R465	A-5C	R583	B-2A	R902	A-4E
Q411	A-2D	R466	A-3D	R584	B-5E	R903	A-4E
Q412	B-2C	R467	A-3D	R585	B-4E	R904	A-2F
Q511	A-2D	R468	A-4D	R586	B-4E	R905	A-2F
Q512	B-2B	R469	A-4D	R587	B-4E	R906	A-2F
Q513	B-2A	R470	A-4D	R588	B-4E	R907	A-2G
Q514	B-3E	R471	B-3C	R589	B-4D	R908	A-3H
Q515	B-6A	R484	B-4E	R590	B-4D	R909	A-3H
Q516	A-3D	R485	B-4E	R591	B-5D	R910	A-4H
Q517	B-3C	R486	B-3E	R592	B-5D	R911	A-4H
Q611	A-2D	R487	B-3E	R593	B-5D	R912	A-4H
Q612	B-2B	R488	B-3E	R594	B-5D	R913	A-5G
		R489	B-3D	R596	B-4D	R914	A-5G
D402	A-3E	R490	B-3D	R597	B-4C	R915	A-5G
D502	A-4E	R491	B-4D	R598	B-5D	R916	B-3F
D602	A-5E	R492	B-4D	R599	B-5C	R917	B-2H
D901	B-1H	R493	B-4D	R631	B-7B	R918	B-2H
D902	B-1H	R494	B-4D	R632	B-6B	R919	B-2H
		R495	B-3D	R633	B-6B	R920	B-3A

R921	B-1H	C63	B-7D	C652	B-5B	TP908	A-5E
R922	B-1G	C64	B-6D	C653	B-5B	TP909	A-2A
R923	A-1H	C65	B-6D	C654	B-4B	TP910	A-3A
R924	A-1H	C66	B-6F	C656	B-5D		
R925	A-6D	C67	A-6D	C661	A-5B	TB901	A-1G
R926	A-6D	C68	A-6E	C662	A-5A	TB903	A-1B
R927	A-6D	C69	B-7D	C663	B-3B	TB904	A-6G
R928	A-6D	C431	B-7C	C664	B-4B		
R929	A-4E	C432	B-7C	C665	B-3B	CN14	A-7C
R930	A-4E	C433	B-6C	C666	B-3A	CN21	A-1E
R931	B-5A	C434	B-6C	C901	A-3E	CN23	A-4A
R932	B-5A	C435	A-7C	C902	A-2F	CN24	A-7G
R933	B-5A	C436	A-5C	C903	A-5G	CN45	A-3H
R934	B-5A	C437	A-5C	C904	B-3G	CN46	A-6H
R935	B-4A	C438	A-3C	C905	B-4G	CN101	A-1H
R936	B-4A	C439	A-2C	C906	B-4G		
R937	B-4A	C451	B-5C	C907	A-6F	K61	B-7D
R938	B-4A	C452	B-5C	C908	B-2H	K901	A-7H
R939	B-4A	C453	B-5C	C909	B-2H	K902	B-7H
R940	B-4A	C454	B-4C	C910	A-1H	K903	B-7H
R941	B-4A	C456	B-3D	C911	B-5A	K904	B-7H
R942	B-4A	C461	A-5C	C912	B-5A	K905	B-7H
R943	B-3A	C462	A-5C	C913	B-4H	K906	B-7H
R944	B-3A	C463	B-3C	C914	B-3H	K907	B-7H
R945	B-3A	C464	B-4C	C915	B-4H	K908	B-7G
R946	B-3A	C465	B-3C	C916	B-5H	K909	B-7G
R947	B-4H	C466	B-3C	C917	B-6H	K910	B-7G
R948	B-4H	C531	B-7C	C918	B-2H	K911	A-6G
R949	B-5H	C532	B-7C	C919	B-4E	K912	B-7G
R1909	A-1D	C533	B-6C			K913	A-6F
R1910	B-1D	C534	A-7B	L401	B-6C	K914	B-7G
R1911	B-1D	C535	A-7B	L402	B-7C	K915	A-6F
R1912	B-1D	C536	A-6B	L403	B-7C	K916	B-7F
R1913	B-1D	C537	A-6B	L404	A-6C	K917	A-6F
R1914	B-1E	C538	A-3B	L405	A-6C	K918	B-7F
R1915	B-1E	C539	A-2C	L406	A-3C	K919	A-6F
R1916	B-1E	C540	A-6B	L407	A-2C	K920	B-7F
R1917	B-1E	C541	A-7B	L501	A-6B	K921	A-6F
R1918	B-1E	C551	B-5B	L502	B-7B	K922	B-7F
R1919	B-1E	C552	B-5C	L503	B-7B	K923	A-6F
R1920	B-1E	C553	B-5B	L504	A-7B	K924	B-7F
R1921	B-1E	C554	B-4C	L505	A-6B	K925	A-6F
R1922	B-1E	C556	B-4D	L506	A-3B	K926	B-7F
R1923	B-1E	C557	A-3D	L507	A-2B	K927	A-6F
R1924	B-1E	C558	A-3C	L508	B-6B	K928	B-7F
R1925	B-1E	C561	A-5C	L509	A-7B	K929	A-6F
R1926	B-1E	C562	A-5B	L601	B-6B		
R1927	B-1E	C563	B-3B	L602	B-7B	X901	A-5G
R1928	B-1F	C564	B-4C	L603	B-7B		
R1929	B-1F	C565	B-3C	L604	A-7A	LC61	B-6D
R1930	B-1F	C566	B-3B	L605	A-7A		
R1931	B-1F	C569	B-2E	L606	A-3B		
R1932	B-1F	C570	B-6A	L607	A-2B		
R1933	B-1F	C571	A-2E				
R1934	B-7G	C572	A-2D	TP402	A-4C		
R1935	B-7G	C573	A-2D	TP403	A-2D		
R1936	B-7G	C574	A-5E	TP502	A-4B		
R1937	B-7F	C631	B-7B	TP503	A-2D		
R1938	A-4E	C632	B-7B	TP602	A-4A		
R1939	A-3H	C633	B-6B	TP603	A-2D		
R1940	A-4H	C634	B-6B	TP901	A-2G		
R1941	A-3H	C635	A-7A	TP902	A-2G		
R1942	A-3H	C636	A-7A	TP903	A-3E		
R1943	B-3H	C637	A-7A	TP904	A-3E		
		C638	A-3B	TP905	A-3E		
C61	B-7D	C639	A-2B	TP906	A-2E		
C62	B-6D	C651	B-5B	TP907	A-2E		

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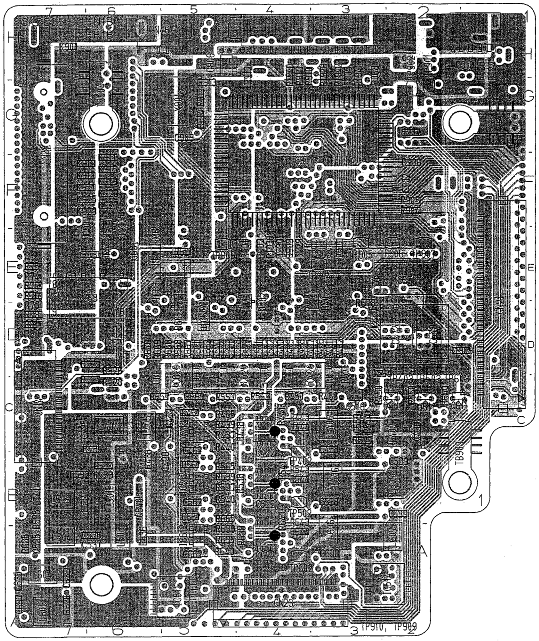

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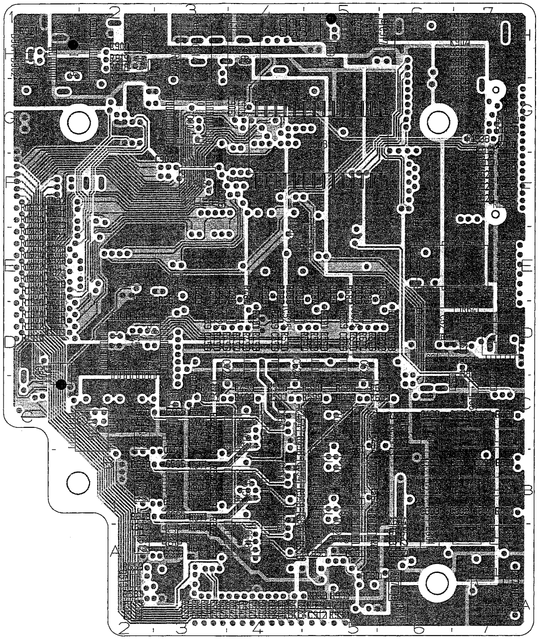
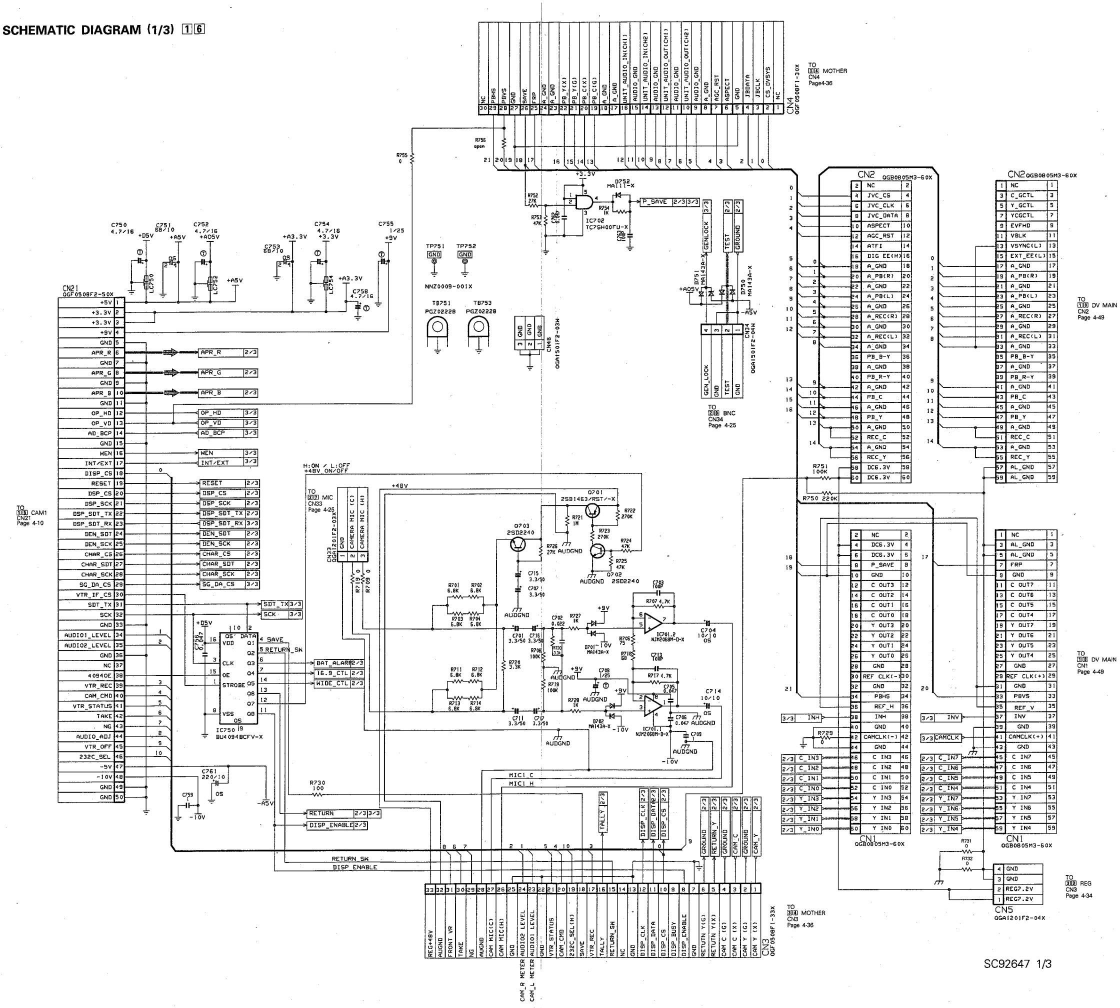


4.9 CAM2(CAMera 2) SCHEMATIC DIAGRAM (1/3) 1 6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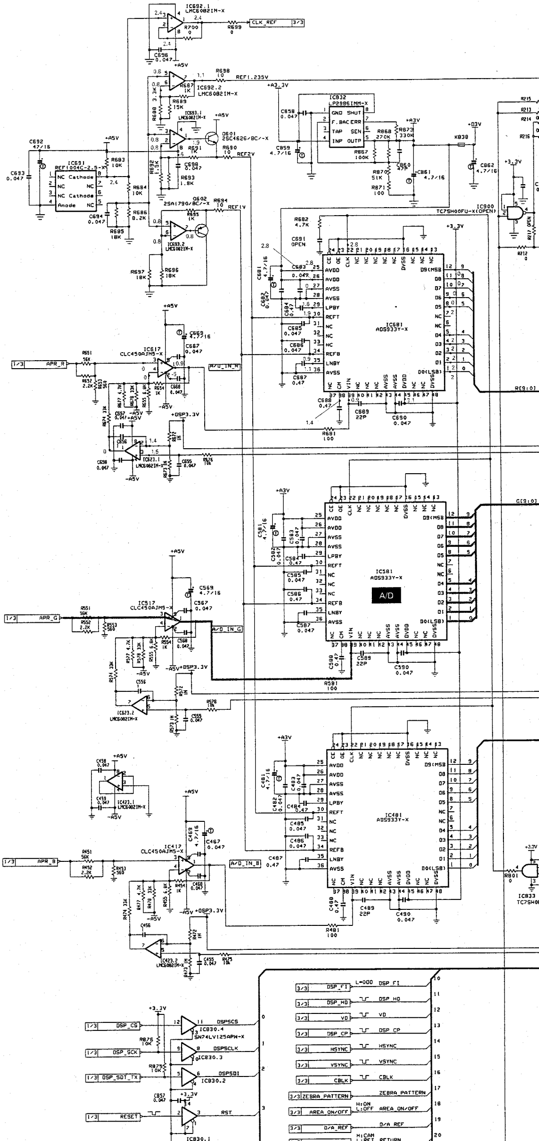
TO MOTHER CN4 Page4-36
CN2 QGB0805M3-60X
TO DV MAIN CN2 Page 4-49
CN21 QGF0508F2-50X
TO CAM1 CN21 Page 4-10
IC702 TC7SH00FU-X
D752 MA111-X
P_SAVE
TP751 GND
TP752 GND
NNZ0009-001X
TB751 PGZ0222B
TB753 PGZ0222B
CN16 QGA1501F2-03W
CN34 QGA1501F2-04H
TO BNC CN34 Page 4-25
GENLOCK
TEST
GROUND
D750 MA143A-X
D751 MA143A-X
TO MIC CN33 Page 4-25
CN33 QGA1201F2-03X
CAMERA MIC (C)
CAMERA MIC (H)
H:ON / L:OFF +48V ON/OFF
Q701 2SB1463/RST/-X
Q702 2SD2240
Q703 2SD2240
IC701.2 NJM2068M-D-X
IC701.1 NJM2068M-D-X
D701 MA143A-X
D702 MA143A-X
IC750 BU4094BCFV-X
BAT_ALARM
16.9_CTL
WIDE_CTL
RETURN
DISP_ENABLE
RETURN_SW
MIC1 C
MIC1 H
TALLY
DISP_CLK
DISP_DATA
DISP_CS
CN1 QGB0805M3-60X
TO DV MAIN CN1 Page 4-49
CN5 QGA1201F2-04X
TO REG CN3 Page 4-34
CN3 QGF0508F1-33X
TO MOTHER CN3 Page 4-36
CAM_R METER
CAM_L METER
SC92647 1/3

· CAM2 SCHEMATIC DIAGRAM (2/3) 16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C696 0.047
R698 10
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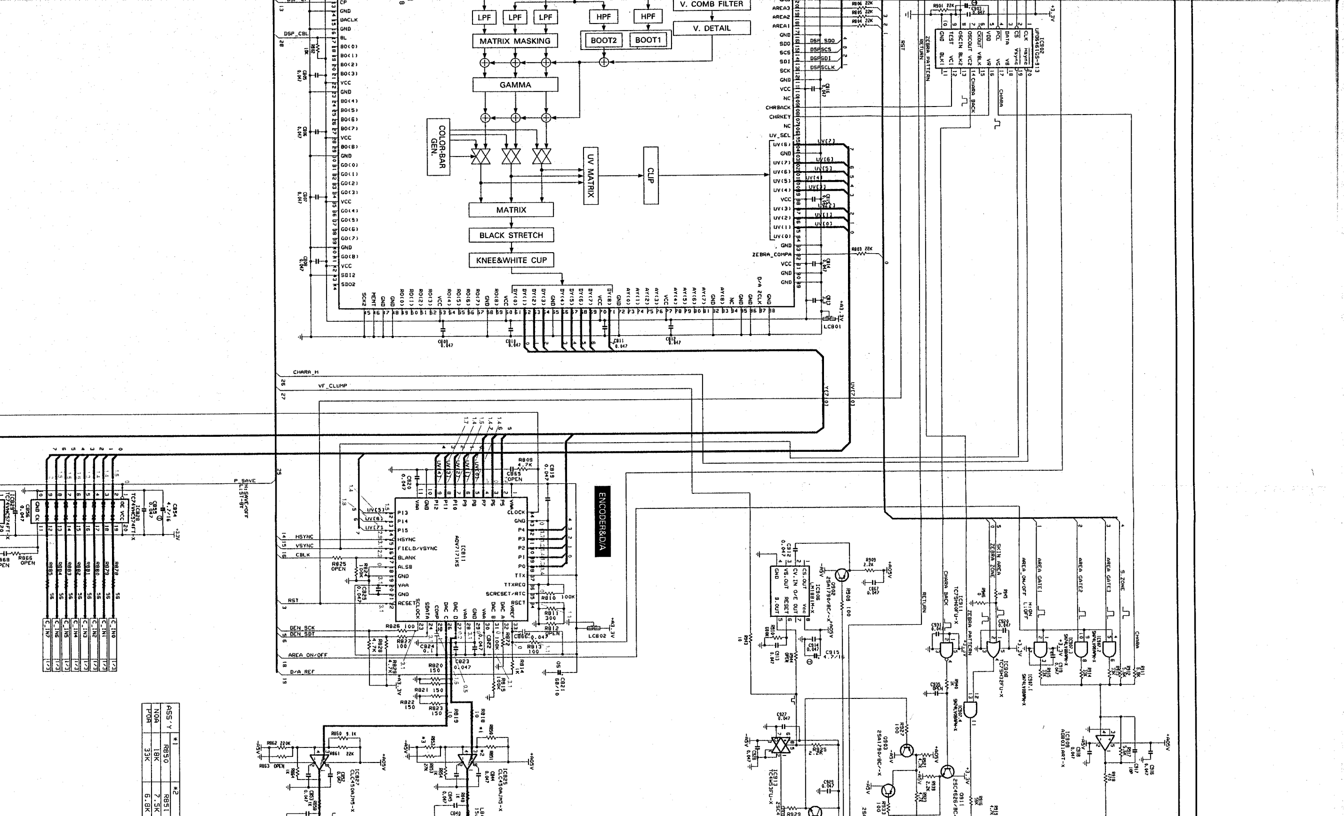
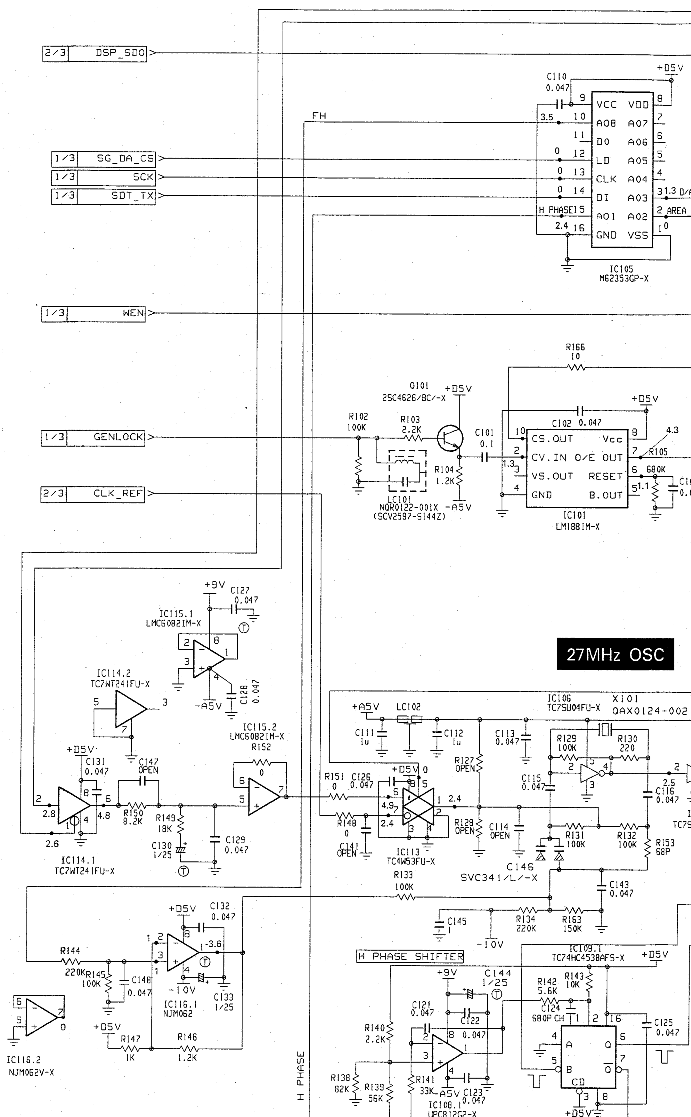
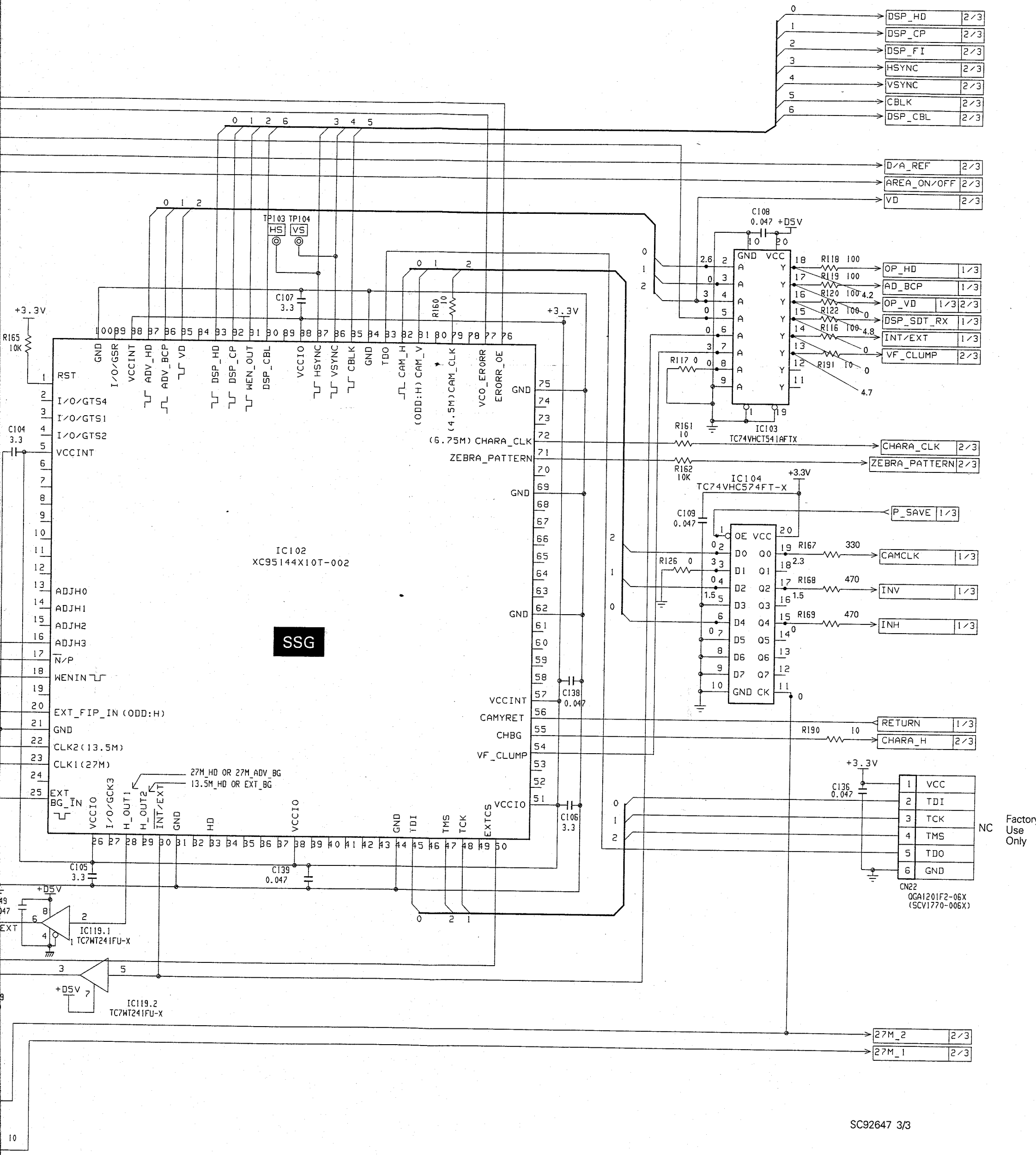
R688 3.3K
R689 15K
IC693.1 LMC6082IM-X
Q601 2SC4626/BC/-X
R690 10
REF2V
C692 47/16
C693 0.047
IC691 REF1004C-2.5-X
NC Cathode
Anode
R683 10K
R684 10K
R686 8.2K
C694 0.047
R685 18K
C698 0.047
R693 1.8K
R692 1.5K
R691 1K
Q602 2SA1790/BC/-X
R694 10
REF1V
R695 1K
IC693.2 LMC6082IM-X
R697 18K
R696 18K
IC832 LP2986IMM-X
GND SHUT
F.BAC ERR
TAP SEN
INP OUTP
C858 0.047
C859 4.7/16
R868 270K
R873 330K
R867 100K
R870 51K
R871 100
C860 47P
C861 4.7/16
K838
C862 4.7/16
+D3V
+A3.3V
+A3V
+A5V
-A5V
+DSP3.3V
+3.3V
IC900 TC7SH00FU-X(OPEN)
R682 4.7K
C691 OPEN
C681 4.7/16
C682 0.047
C683 0.047
C684 0.47
C685 0.047
C686 0.047
C687 0.47
C688 0.47
C689 22P
C690 0.047
R681 100
IC681 ADS933Y-X
R[9:0]
IC617 CLC450AJM5-X
APR_R 1/3
R651 56K
R652 2.2K
R653 560
R654 1K
R655 6.8K
R677 4.7K
R678 33K
R674 33K
C667 0.047
C668 0.047
C669 4.7/16
A/D_IN_R
IC623.1 LMC6082IM-X
C656
C657 0.047
C658 0.047
C655 0.047
R672 1M
R673 1M
R676 10K
G[9:0]
IC581 ADS933Y-X
A/D
C581 4.7/16
C582 0.047
C583 0.047
C584 0.47
C585 0.047
C586 0.47
C587 0.047
C588 0.47
C589 22P
C590 0.047
R581 100
IC517 CLC450AJM5-X
APR_G 1/3
R551 56K
R552 2.2K
R553 560
R554 1K
R555 6.8K
R577 4.7K
R578 33K
R574 33K
C567 0.047
C568 0.047
C569 4.7/16
A/D_IN_G
IC623.2 LMC6082IM-X
C556
C555 0.047
R572 1M
R573 1M
R576 10K
IC481 ADS933Y-X
C481 4.7/16
C482 0.047
C483 0.047
C484 0.47
C485 0.047
C486 0.047
C487 0.47
C488 0.47
C489 22P
C490 0.047
R481 100
IC423.1 LMC6082IM-X
C458 0.047
C459 0.047
IC417 CLC450AJM5-X
APR_B 1/3
R451 56K
R452 2.2K
R453 560
R454 1K
R455 6.8K
R477 4.7K
R478 33K
R474 33K
C467 0.047
C468 0.047
C469 4.7/16
A/D_IN_B
IC423.2 LMC6082IM-X
C456
C455 0.047
R472 1M
R473 1M
R475 10K
R801 0
IC833 TC7SH0
R212 0
R217 OPEN
R213
R214
R215
R216
AVDD
AVSS
LPBY
REFT
REFB
LNBY
NC
CM
VIN
DVDD
DVSS
CE
OE
CLK
D9(MSB)
D0(LSB)
DSP_CS 1/3
DSP_SCK 1/3
DSP_SDT_TX 1/3
RESET 1/3
IC830.4 SN74LV125APW-X
IC830.3
IC830.2
IC830.1
R876 10K
R875 10K
C857 0.047
DSPSCS
DSPSCLK
DSPSDI
RST
DSP_FI 3/3
L=ODD DSP FI
DSP_HD 3/3
DSP HD
VD 3/3
DSP_CP 3/3
DSP CP
HSYNC 3/3
VSYNC 3/3
CBLK 3/3
ZEBRA_PATTERN 3/3
ZEBRA PATTERN
AREA_ON/OFF 3/3
H:ON L:OFF AREA ON/OFF
D/A_REF 3/3
D/A REF
H:CAM L:RET RETURN


LPF
LPF
LPF
HPF
HPF
V. COMB FILTER
V. DETAIL
MATRIX MASKING
BOOT2
BOOT1
GAMMA
COLOR-BAR GEN.
UV MATRIX
CLIP
MATRIX
BLACK STRETCH
KNEE&WHITE CUP
ENCODER&D/A
IC811 ADV7171KS
IC902 UPD6461GS-913
IC906 LM1881M-X
IC913 TC4W53FU-X
IC825 CLC450AJM5-X
IC827 CLC450AJM5-X
IC909 AD8031ART-X
CHARA_H
VF_CLUMP
P_SAVE
H:SAVE/OFF L:ST-BY
HSYNC
VSYNC
CBLK
RST
DEN_SCK
DEN_SDT
AREA_ON/OFF
D/A_REF
DSP_CBL
CHRBACK
CHRKEY
UV_SEL
ZEBRA_COMPA
AREA3
AREA2
AREA1
DSP_SDO
DSPSCS
DSPSDI
DSPSCLK
ZEBRA PATTERN
RETURN
CHARA BACK
CHARA
SKIN AREA
ZEBRA ZONE
AREA ON/OFF
H:ON L:OFF
AREA GATE1
AREA GATE2
AREA GATE3
S.ZONE
Y[7:0]
UV[7:0]
C_IN0
C_IN1
C_IN2
C_IN3
C_IN4
C_IN5
C_IN6
C_IN7
+3.3V
+A3.3V
+A05V
-A5V
LCB01
LCB02

ASS'Y	*1 R850	*2 R851
N0A	18K	7.5K
P0A	33K	6.8K

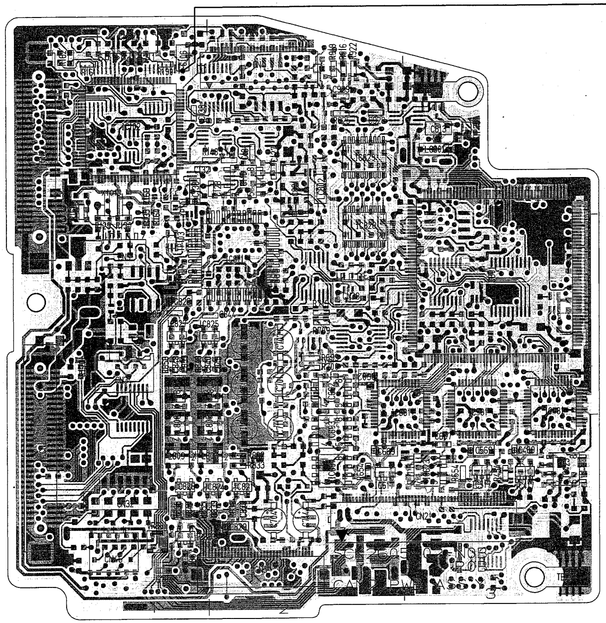
· CAM2 SCHEMATIC DIAGRAM (3/3) 16


2/3 DSP_SDO
1/3 SG_DA_CS
1/3 SCK
1/3 SDT_TX
1/3 WEN
1/3 GENLOCK
2/3 CLK_REF
FH
H PHASE
+D5V
C110 0.047
IC105 M62353GP-X
VCC VDD
A08 A07
D0 A06
LD A05
CLK A04
DI A03
A01 A02
GND VSS
H PHASE
AREA
R166 10
Q101 2SC4626/BC/-X
R102 100K
R103 2.2K
R104 1.2K
C101 0.1
C102 0.047
LC101 NQR0122-001X (SCV2597-S144Z)
-A5V
IC101 LM1881M-X
CS.OUT Vcc
CV.IN O/E OUT
VS.OUT RESET
GND B.OUT
R105 680K
4.3
27MHz OSC
+9V
C127 0.047
IC115.1 LMC6082IM-X
C128 0.047
IC114.2 TC7WT241FU-X
IC115.2 LMC6082IM-X
R152 0
C131 0.047
C147 OPEN
R150 8.2K
R149 18K
C130 1/25
C129 0.047
IC114.1 TC7WT241FU-X
2.8
2.6
4.8
+A5V
LC102
C111 1u
C112 1u
IC106 TC7SU04FU-X
X101 QAX0124-002
C113 0.047
R129 100K
R130 220
R127 OPEN
R151 0
C126 0.047
R148 0
C141 OPEN
IC113 TC4W53FU-X
4.9
2.4
R128 OPEN
C114 OPEN
C115 0.047
C116 0.047
2.5
R131 100K
R132 100K
R153 68P
C146 SVC341/L/-X
R133 100K
C143 0.047
C145 1
R134 220K
R163 150K
-10V
C132 0.047
-3.6
R144 220K
R145 100K
C148 0.047
IC116.1 NJM062
C133 1/25
R147 1K
R146 1.2K
IC116.2 NJM062V-X
H PHASE SHIFTER
C144 1/25
IC109.1 TC74HC4538AFS-X
R142 5.6K
R143 10K
C124 680P CH
C125 0.047
C121 0.047
C122 0.047
R140 2.2K
R138 82K
R139 56K
R141 33K
C123 0.047
IC108.1 UPC812G2-X
CD
Q

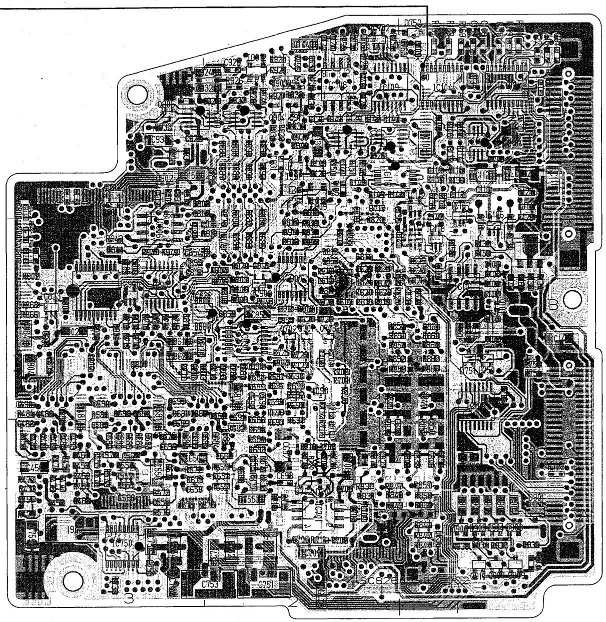

IC102
XC95144XL0T-002
SSG
RST
I/O/GTS4
I/O/GTS1
I/O/GTS2
VCCINT
ADJH0
ADJH1
ADJH2
ADJH3
N/P
WENIN
EXT_FIP_IN (ODD:H)
GND
CLK2 (13.5M)
CLK1 (27M)
EXT BG_IN
VCCIO
I/O/GCK3
H_OUT1
H_OUT2
INT/EXT
HD
TDI
TMS
TCK
EXTCS
27M_HD OR 27M_ADV_BG
13.5M_HD OR EXT_BG
GND
I/O/GSR
ADV_HD
ADV_BCP
VD
DSP_HD
DSP_CP
WEN_OUT
DSP_CBL
HSYNC
VSYNC
CBLK
TDO
CAM_H
(ODD:H) CAM_V
(4.5M) CAM_CLK
VCO_ERORR
ERORR_OE
(6.75M) CHARA_CLK
ZEBRA_PATTERN
CAMYRET
CHBG
VF_CLUMP
TP103 TP104
HS
VS
C107 3.3
R160 10
R165 10K
+3.3V
C104 3.3
C105 3.3
C139 0.047
C138 0.047
C106 3.3
+D5V
IC119.1 TC7WT241FU-X
IC119.2 TC7WT241FU-X
EXT
C108 0.047 +D5V
IC103 TC74VHCT541AFTX
R118 100
R119 100
R120 100
R122 100
R116 100
R191 10
R117 0
R161 10
R162 10K
IC104 TC74VHC574FT-X
C109 0.047
R126 0
R167 330
R168 470
R169 470
R190 10
C136 0.047
CN22 QGA1201F2-06X (SCV1770-006X)
VCC
TDI
TCK
TMS
TDO
GND
NC
Factory Use Only
DSP_HD 2/3
DSP_CP 2/3
DSP_FI 2/3
HSYNC 2/3
VSYNC 2/3
CBLK 2/3
DSP_CBL 2/3
D/A_REF 2/3
AREA_ON/OFF 2/3
VD 2/3
OP_HD 1/3
AD_BCP 1/3
OP_VD 1/3 2/3
DSP_SDT_RX 1/3
INT/EXT 1/3
VF_CLUMP 2/3
CHARA_CLK 2/3
ZEBRA_PATTERN 2/3
P_SAVE 1/3
CAMCLK 1/3
INV 1/3
INH 1/3
RETURN 1/3
CHARA_H 2/3
27M_2 2/3
27M_1 2/3

4.10 CAM2 CIRCUIT BOARD

– SIDE A –



– SIDE B –



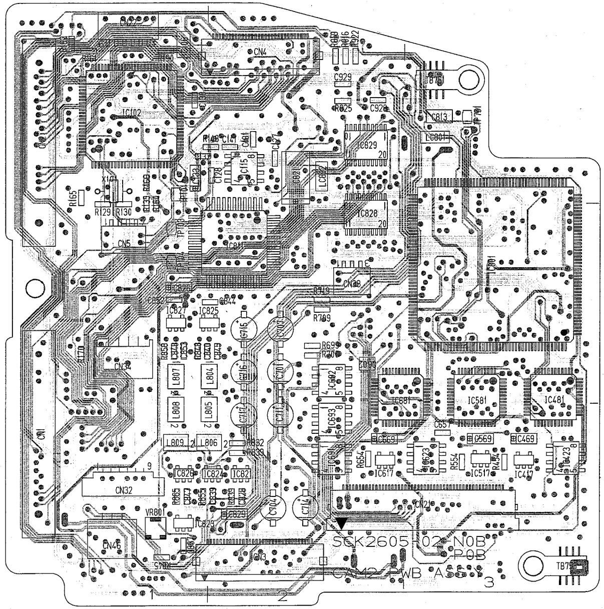
● **ADDRESS TABLE OF BOARD PARTS**

Each address may have an address error by one interval.

```
      A-1C
Side ─┘│ └──Y axis
       └────X axis
```

IC101	B-1B	IC681	A-2B	IC907	B-2B	D701	B-2A	R122	B-1C	R149	B-2C	R213	B-3B	R574	B-3A	R689	B-2B	R716	B-2A	R803	B-2C	R829	B-1B	R859	B-1A	R883	B-2B	R921	B-2C	VR801	A-1A	C123	B-2C
IC102	A-1C	IC691	A-2A	IC908	B-2B	D702	B-2A	R126	B-1C	R150	B-2C	R214	B-3B	R576	B-3A	R690	B-2B	R717	B-2A	R804	B-2B	R830	B-2A	R860	B-1B	R884	B-2B	R922	A-2C			C124	B-2C
IC103	B-1C	IC692	A-2B	IC909	B-2C	D750	B-1B	R127	B-1C	R151	B-2C	R215	B-3B	R577	B-3A	R691	B-2A	R718	B-2A	R805	B-2B	R831	B-2A	R861	B-1B	R885	B-2B	R923	B-2C	C101	B-1B	C125	B-2C
IC104	B-1C	IC693	A-2A	IC910	B-2C	D751	B-1B	R128	B-1B	R152	B-2C	R216	B-3B	R578	B-3A	R692	B-2B	R719	A-2B	R806	B-2B	R832	A-2A	R862	B-1B	R886	B-2C	R924	B-2C	C102	B-1B	C126	B-2C
IC105	B-1B	IC701	B-2A	IC911	B-2C	D752	B-1C	R129	A-1C	R153	B-1B	R217	B-3B	R581	B-3B	R693	B-2B	R720	B-2B	R807	B-2B	R833	A-2A	R863	B-1B	R887	B-2C	R925	A-2C	C103	B-1B	C127	A-2C
IC106	B-1B	IC702	B-2C	IC912	B-2C	D901	B-1A	R130	A-1C	R157	B-1B	R451	B-3A	R651	B-2A	R694	B-2B	R721	B-2B	R808	B-2B	R839	A-2A	R864	B-1B	R888	B-2C	R926	B-2C	C104	B-1C	C128	A-1C
IC107	B-1C	IC750	B-3A	IC913	B-2C	D903	B-1A	R131	B-1B	R158	B-1C	R452	B-3A	R652	B-2A	R695	B-2B	R722	B-2B	R809	B-2B	R841	B-1A	R865	A-1A	R889	B-2C	R927	B-2C	C105	B-1C	C129	B-2C
IC108	B-2C	IC801	A-3B			D904	B-1A	R132	B-1B	R159	B-1C	R453	B-3A	R653	B-2A	R696	B-2B	R723	B-2B	R810	B-2B	R842	B-1A	R866	B-3B	R890	B-2C	R929	B-2C	C106	A-1C	C130	B-2C
IC109	B-2C	IC811	A-2B	Q101	B-1B	D905	B-1A	R133	B-1B	R160	B-1C	R454	A-3A	R654	A-2A	R697	B-2A	R724	B-2B	R811	B-2B	R843	B-1A	R867	B-2B	R891	B-2C	R930	B-2C	C107	B-1C	C131	A-2C
IC112	B-1C	IC821	A-2A	Q601	B-2B	D906	B-1A	R134	B-1B	R161	A-1C	R455	B-3A	R655	B-2A	R698	B-2B	R725	B-2B	R812	B-2B	R844	B-1A	R868	B-2B	R892	B-2C	R931	B-3C	C108	B-1C	C132	A-1C
IC113	B-2C	IC823	A-1A	Q602	A-2B			R135	A-1C	R162	A-1C	R472	B-3A	R672	B-3A	R699	A-2B	R726	B-2B	R813	B-2B	R845	A-1A	R869	B-1A	R893	B-2C	R932	B-3C	C109	B-1C	C133	A-1C
IC114	B-2C	IC824	A-1A	Q701	B-2B	R102	B-1B	R136	B-1C	R163	B-1B	R473	B-3A	R673	B-3A	R700	A-2B	R727	B-2A	R814	B-2B	R846	B-1A	R870	B-2B	R901	B-3B	R933	B-2C	C110	B-1B	C135	B-1C
IC115	A-2C	IC825	A-1B	Q702	B-2B	R103	B-1B	R137	B-1C	R164	A-1C	R474	B-3A	R674	B-2A	R701	B-2B	R728	B-2A	R815	B-2B	R847	B-1A	R871	B-3B	R908	B-3C	R934	B-1A	C111	B-1C	C136	B-1C
IC116	B-1C	IC826	A-1A	Q703	B-2B	R104	B-1B	R138	B-2C	R165	A-1C	R475	B-3A	R676	B-3A	R702	B-2B	R729	B-1A	R818	B-2B	R848	A-1B	R872	B-2B	R909	B-3C	R935	B-1A	C112	B-1C	C138	A-1C
IC117	B-1B	IC827	A-1B	Q902	B-3C	R105	B-1B	R139	B-2C	R166	A-1C	R477	B-3A	R677	B-2A	R703	B-2B	R730	B-3A	R819	B-2B	R849	B-2A	R873	B-2B	R910	B-2B	R937	B-1A	C113	B-1C	C139	B-1C
IC118	B-1B	IC828	A-2B	Q903	B-2C	R106	B-1C	R140	B-2C	R167	B-1C	R478	B-3A	R678	B-2A	R704	B-2B	R750	B-1B	R820	B-2B	R850	B-1B	R874	B-3B	R911	B-2B	R938	B-1A	C114	B-1C	C140	B-1B
IC119	B-1C	IC829	A-2C	Q904	B-2C	R107	B-1C	R141	B-2C	R168	B-1C	R481	B-3B	R681	B-3B	R706	B-2A	R751	B-1B	R821	B-2B	R851	B-1B	R875	B-3A	R912	B-2B	R939	B-2C	C115	B-1B	C141	A-2C
IC417	A-3A	IC830	B-2B	Q905	B-2C	R114	B-1C	R142	B-2C	R169	B-1C	R551	B-3A	R682	B-2A	R707	B-2A	R752	B-2C	R822	B-2B	R852	B-1B	R876	B-2A	R913	B-2B	R940	B-2C	C116	B-1B	C142	B-1B
IC423	A-3A	IC832	B-2B	Q906	B-3C	R115	B-1C	R143	B-2C	R170	A-1B	R552	B-3A	R683	B-2A	R708	B-2A	R753	B-2C	R823	B-2B	R853	B-1B	R877	B-2A	R914	B-2B	R941	B-3B	C117	B-1C	C143	B-1B
IC481	A-3B	IC833	B-3B	Q907	B-1A	R116	B-1C	R144	B-1C	R190	A-1C	R553	B-3A	R684	B-2A	R709	A-2B	R754	B-1C	R824	B-1B	R854	B-1B	R878	B-2B	R915	B-2B	R942	B-3B	C118	B-1C	C144	B-2C
IC517	A-3A	IC900	B-3B	Q909	B-1A	R117	B-1C	R145	B-2C	R191	B-1C	R554	A-3A	R685	B-2A	R711	B-2A	R755	B-2C	R825	B-1B	R855	A-1A	R879	B-2B	R916	A-2C	R943	B-3B	C119	B-1C	C145	B-1B
IC581	A-3B	IC901	B-3B	Q910	B-1A	R118	B-1C	R146	B-2C	R210	B-3B	R555	B-3A	R686	B-2A	R712	B-2B	R756	B-2C	R826	B-1B	R856	B-1A	R880	B-2B	R917	B-2B	R944	B-3B	C120	B-2C	C146	B-1B
IC617	A-2A	IC902	B-3B	Q911	B-2C	R119	B-1C	R147	B-2C	R211	B-3B	R572	B-3A	R687	B-2B	R713	B-2A	R801	B-3B	R827	B-1B	R857	B-1A	R881	B-2B	R918	B-2B	R945	B-2B	C121	B-2C	C147	B-2C
IC623	A-3A	IC906	B-3C			R120	B-1C	R148	A-1C	R212	B-3B	R573	B-3A	R688	B-2B	R714	B-2B	R802	B-3B	R828	B-1B	R858	A-1B	R882	B-2B	R919	A-2C	R946	B-2B	C122	B-2C	C148	B-2C

– INNER PATTERN (SIDE A) –



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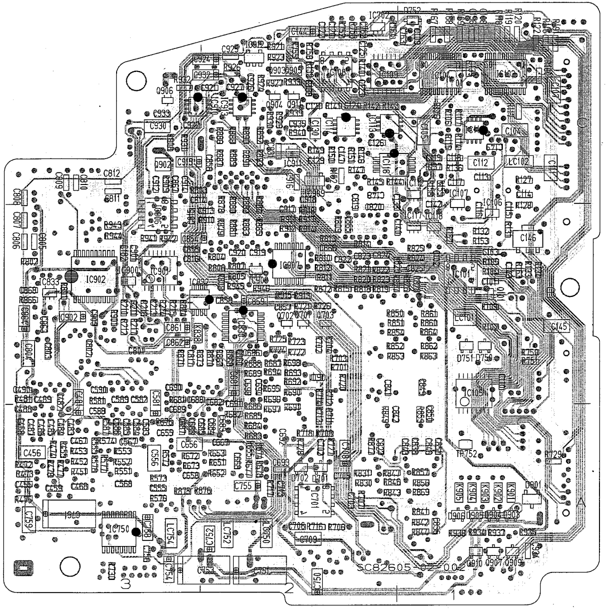
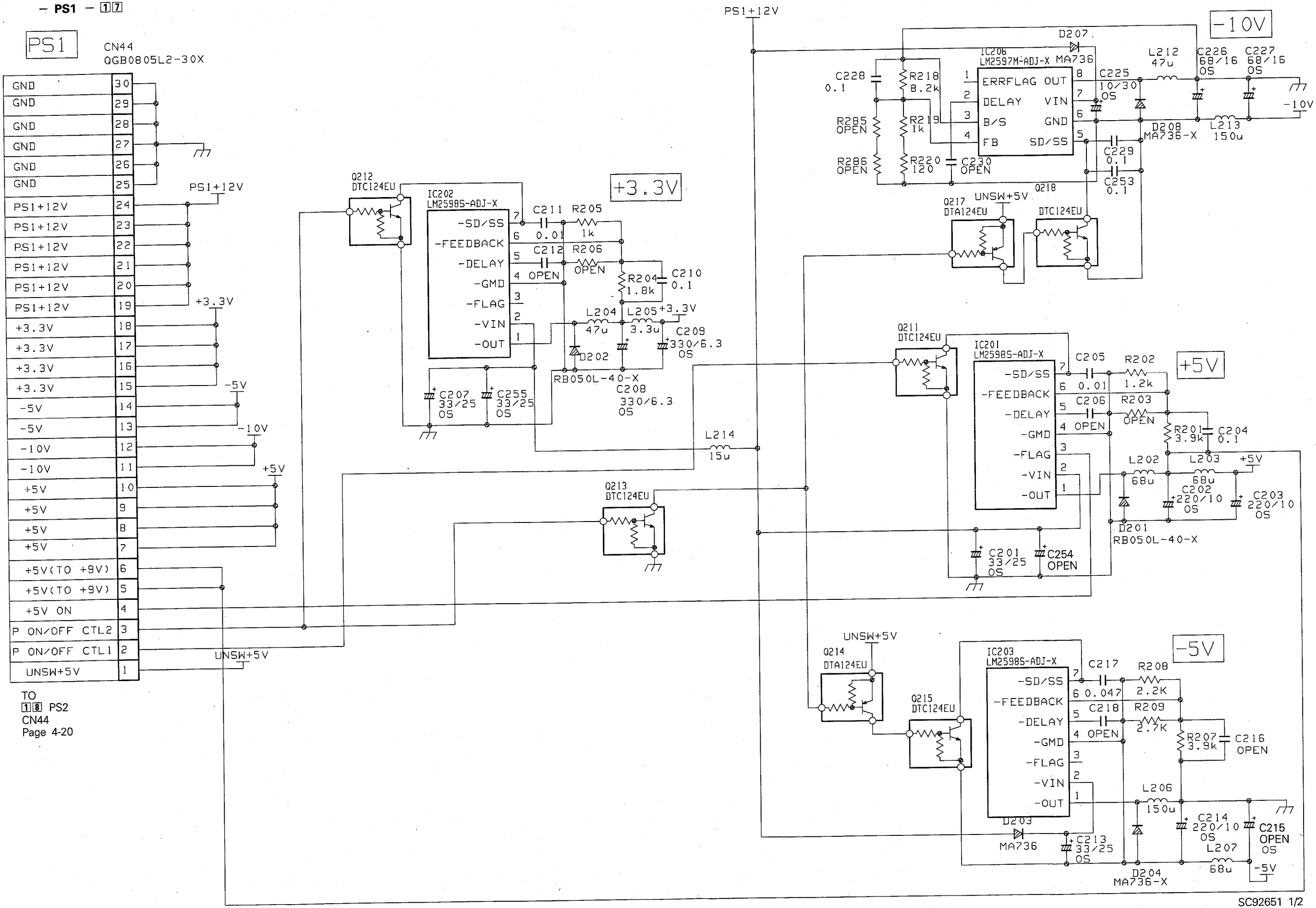


C149	B-1C	C581	B-3B	C688	B-2B	C750	B-2A	C813	A-3C	C844	A-1B	C868	B-3B	C933	B-3C	LC750	B-2A
C182	B-3B	C582	B-3B	C689	B-3A	C751	B-2A	C814	B-2C	C845	A-2B	C901	B-3B	C934	B-1A	LC752	B-2A
C455	B-3A	C583	B-3A	C690	B-3B	C752	B-2A	C815	B-3B	C846	B-1A	C902	B-3B	C935	B-2C	LC754	B-3A
C456	B-3A	C584	B-3A	C691	B-2B	C753	B-2A	C816	B-3B	C847	A-1A	C903	B-3B			LC801	A-3C
C458	B-3A	C585	B-3A	C692	B-2A	C754	B-3A	C817	B-3B	C848	A-1B	C912	B-3C	L804	A-1B	LC802	A-2C
C459	B-3A	C586	B-3A	C693	B-2A	C755	B-2A	C819	B-2C	C849	B-1B	C913	B-2B	L805	A-1A		
C467	B-3A	C587	B-3A	C694	B-2B	C756	B-3A	C820	B-2B	C850	B-1A	C914	B-3C	L806	A-1A	K838	B-2B
C468	B-3A	C588	B-3A	C696	B-2B	C758	B-3A	C821	A-2C	C851	B-1A	C915	B-3C	L807	A-1B	K901	B-1A
C469	A-3A	C589	B-3B	C698	B-2B	C759	B-3A	C822	B-2B	C852	A-1B	C916	B-2C	L808	A-1A	K902	B-1A
C481	B-3B	C590	B-3B	C701	A-2B	C761	B-3A	C823	B-2B	C853	A-1B	C917	B-2B	L809	A-1A	K903	B-1A
C482	B-3B	C655	B-3A	C702	B-2A	C762	B-2C	C824	B-2B	C854	B-3B	C918	B-2C			K904	B-1A
C483	B-3A	C656	B-3A	C703	B-2A	C763	B-1C	C825	B-1B	C855	B-3B	C919	B-2B	TP101	A-1C	K905	B-1A
C484	B-3A	C657	A-3A	C704	A-2A	C801	B-3B	C826	A-1B	C856	B-2C	C920	B-2B	TP103	A-1B		
C485	B-3A	C658	B-3A	C705	B-2A	C802	B-3B	C827	B-2A	C857	B-2B	C921	B-2C	TP104	A-1B	CN1	A-1A
C486	B-3A	C667	B-2A	C706	B-2A	C803	B-3B	C828	A-2A	C858	B-2B	C922	B-3C	TP751	A-3C	CN2	A-1C
C487	B-3A	C668	B-2A	C707	A-2B	C804	B-3B	C829	A-2A	C859	B-2B	C924	B-2C	TP752	B-1A	CN3	A-2A
C488	B-3A	C669	A-2A	C708	B-2A	C805	B-3B	C836	B-1A	C860	B-2B	C925	B-2C			CN4	A-2C
C489	B-3B	C681	B-2B	C709	B-2A	C806	B-3B	C837	A-1A	C861	B-3B	C926	B-2C	TB751	A-3C	CN5	A-1B
C490	B-3B	C682	B-2B	C711	A-2A	C807	B-3B	C838	B-1A	C862	B-3B	C927	B-2C	TB753	A-3A	CN21	A-3A
C555	B-3A	C683	B-2A	C713	B-2A	C808	B-3C	C839	A-1A	C863	B-3B	C928	A-2C			CN22	A-1C
C556	B-3A	C684	B-2A	C714	A-2A	C809	B-3C	C840	A-1B	C864	B-3B	C929	A-2C	X101	A-1C	CN32	A-1A
C567	B-3A	C685	B-2A	C715	A-2B	C810	B-3C	C841	B-2B	C865	B-2B	C930	B-3C			CN33	A-2B
C568	B-3A	C686	B-3A	C716	A-2B	C811	B-3C	C842	B-1A	C866	B-2B	C931	B-2C	LC101	B-1B	CN34	A-1B
C569	A-3A	C687	B-3A	C717	A-2A	C812	B-3C	C843	B-1A	C867	B-3C	C932	B-2C	LC102	B-1C	CN46	A-1A

4.11 PS(Power Supply)1, PS2 SCHEMATIC DIAGRAM (1/2) 17/18

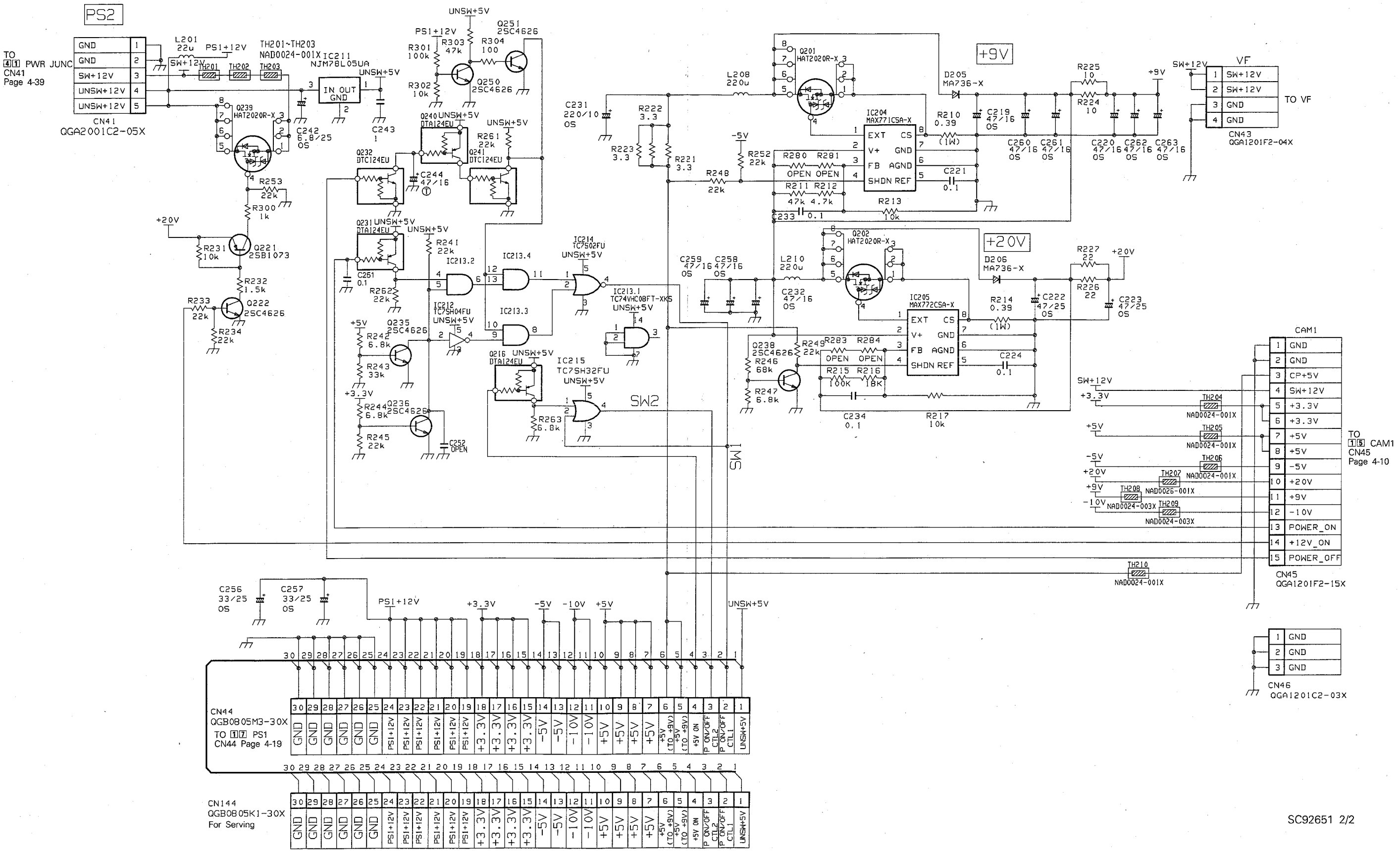
– PS1 – 17


PS1
CN44
QGB0805L2-30X
GND 30
GND 29
GND 28
GND 27
GND 26
GND 25
PS1+12V 24
PS1+12V 23
PS1+12V 22
PS1+12V 21
PS1+12V 20
PS1+12V 19
+3.3V 18
+3.3V 17
+3.3V 16
+3.3V 15
-5V 14
-5V 13
-10V 12
-10V 11
+5V 10
+5V 9
+5V 8
+5V 7
+5V(TO +9V) 6
+5V(TO +9V) 5
+5V ON 4
P ON/OFF CTL2 3
P ON/OFF CTL1 2
UNSW+5V 1
TO
18 PS2
CN44
Page 4-20
PS1+12V
+3.3V
-5V
-10V
+5V
UNSW+5V
Q212
DTC124EU
IC202
LM2598S-ADJ-X
-SD/SS
-FEEDBACK
-DELAY
-GMD
-FLAG
-VIN
-OUT
C211 0.01
R205 1k
C212 OPEN
R206 OPEN
4 OPEN
R204 1.8k
C210 0.1
L204 47u
L205 3.3u
C209 330/6.3 OS
D202
RB050L-40-X
C208 330/6.3 OS
C207 33/25 OS
C255 33/25 OS
+3.3V
L214 15u
Q213
DTC124EU
PS1+12V
D207
MA736
IC206
LM2597M-ADJ-X
ERRFLAG OUT
DELAY VIN
B/S GND
FB SD/SS
C228 0.1
R218 8.2k
R219 1k
R285 OPEN
R286 OPEN
R220 120
C230 OPEN
C225 10/30 OS
L212 47u
C226 68/16 OS
C227 68/16 OS
-10V
D208 MA736-X
L213 150u
C229 0.1
C253 0.1
Q217
DTA124EU
UNSW+5V
Q218
DTC124EU
Q211
DTC124EU
IC201
LM2598S-ADJ-X
+5V
C205 0.01
R202 1.2k
C206
R203 OPEN
4 OPEN
R201 3.9k
C204 0.1
L202 68u
L203 68u
+5V
C202 220/10 OS
C203 220/10 OS
D201
RB050L-40-X
C201 33/25 OS
C254 OPEN
UNSW+5V
Q214
DTA124EU
Q215
DTC124EU
IC203
LM2598S-ADJ-X
-5V
C217 0.047
R208 2.2K
C218
R209 2.7K
4 OPEN
R207 3.9k
C216 OPEN
L206 150u
D203
MA736
C213 33/25 OS
C214 220/10 OS
C215 OPEN OS
L207 68u
-5V
D204
MA736-X

SC92651 1/2

• PS1, PS2 SCHEMATIC DIAGRAM (2/2) 17/18

– PS2 – 18

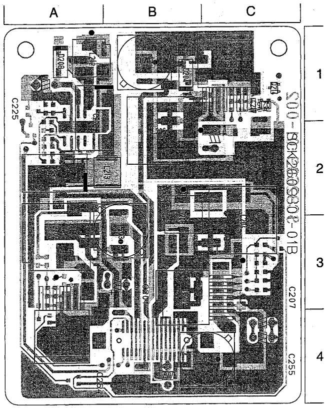

PS2
TO 41 PWR JUNC CN41 Page 4-39
GND
GND
SW+12V
UNSW+12V
UNSW+12V
CN41
QGA2001C2-05X
L201 22u
PS1+12V
TH201~TH203 NAD0024-001X
IC211 NJM78L05UA
IN OUT GND
UNSW+5V
C242 6.8/25 OS
C243 1
Q239 HAT2020R-X
R253 22k
R300 1k
+20V
R231 10k
Q221 2SB1073
R232 1.5k
R233 22k
Q222 2SC4626
R234 22k
UNSW+5V
PS1+12V
R301 100k
R303 47k
R304 100
Q251 2SC4626
R302 10k
Q250 2SC4626
Q240 DTA124EU
Q232 DTC124EU
C244 47/16
R261 22k
Q241 DTC124EU
Q231 DTA124EU
R241 22k
C251 0.1
R262 22k
IC213.2
IC213.4
IC214 TC7S02FU
IC212 TC7SH04FU
IC213.3
IC213.1 TC74VHC08FT-XKS
Q235 2SC4626
R242 6.8k
R243 33k
+3.3V
R244 6.8k
Q236 2SC4626
R245 22k
C252 OPEN
Q216 DTA124EU
IC215 TC7SH32FU
R263 6.8k
SW2
SW1
C231 220/10 OS
R222 3.3
R223 3.3
R221 3.3
-5V
R252 22k
R248 22k
L208 220u
Q201 HAT2020R-X
IC204 MAX771CSA-X
EXT CS
V+ GND
FB AGND
SHDN REF
R280 R281 OPEN OPEN
R211 47k
R212 4.7k
R213 10k
C233 0.1
C221 0.1
+9V
D205 MA736-X
R210 0.39 (1W)
C219 47/16 OS
R225 10
R224 10
C260 47/16 OS
C261 47/16 OS
C220 47/16 OS
C262 47/16 OS
C263 47/16 OS
VF
SW+12V
SW+12V
GND
GND
TO VF
CN43 QGA1201F2-04X
C259 47/16 OS
C258 47/16 OS
L210 220u
C232 47/16 OS
Q202 HAT2020R-X
+20V
D206 MA736-X
R227 22
R226 22
IC205 MAX772CSA-X
R214 0.39 (1W)
C222 47/25 OS
C223 47/25 OS
Q238 2SC4626
R249 22k
R283 R284 OPEN OPEN
R246 68k
R215 100k
R216 18k
R247 6.8k
C224 0.1
C234 0.1
R217 10k
CAM1
GND
GND
CP+5V
SW+12V
+3.3V
+3.3V
+5V
+5V
-5V
+20V
+9V
-10V
POWER_ON
+12V_ON
POWER_OFF
TH204 NAD0024-001X
TH205 NAD0024-001X
TH206 NAD0024-001X
TH207 NAD0024-001X
TH208 NAD0026-001X
TH209 NAD0024-003X
TH210 NAD0024-001X
TO 15 CAM1 CN45 Page 4-10
CN45 QGA1201F2-15X
GND
GND
GND
CN46 QGA1201C2-03X
C256 33/25 OS
C257 33/25 OS
PS1+12V
+3.3V
-5V
-10V
+5V
UNSW+5V
CN44 QGB0805M3-30X
TO 17 PS1 CN44 Page 4-19
CN144 QGB0805K1-30X For Serving
GND
PS1+12V
+3.3V
-5V
-10V
+5V
+5V (TO +9V)
+5V (TO +9V)
+5V ON
P ON/OFF CTL2
P ON/OFF CTL1
UNSW+5V

SC92651 2/2

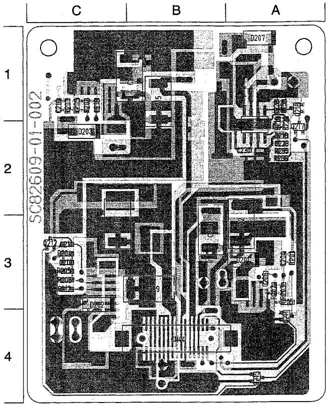
4.12 PS1, PS2 CIRCUIT BOARD

· PS1

– SIDE A –



– SIDE B –



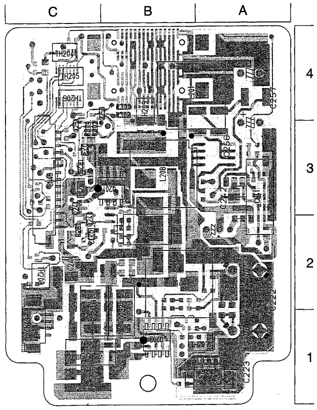
● **ADDRESS TABLE OF BOARD PARTS**
Each address may have an address error by one interval.

A-1C
Side — Y axis
X axis

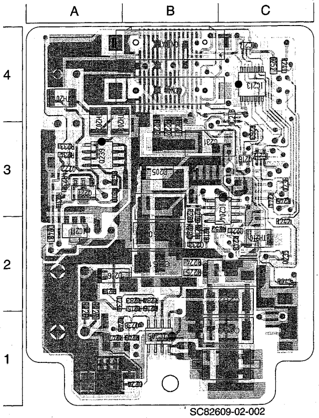
IC201	A-4A
IC202	A-3B
IC203	A-1C
IC206	B-2A
Q211	B-4A
Q212	B-3C
Q213	B-4A
Q214	A-1C
Q215	A-1C
Q217	B-2A
Q218	B-1A
D201	B-3A
D202	B-3C
D203	B-2C
D204	A-1B
D207	B-1A
D208	A-1A
R201	B-3A
R202	B-3A
R203	B-3A
R204	B-3C
R205	B-3C
R206	B-3C
R207	B-1C
R208	B-1C
R209	B-1C
R218	B-2A
R219	B-2A
R220	B-2A
R285	B-2A
R286	B-2A
C201	A-3B
C202	B-3A
C203	B-3B
C204	B-3A
C205	B-3A
C206	B-3A
C207	A-4C
C208	B-3C
C209	B-3B
C210	B-3C
C211	B-3C
C212	B-3C
C213	A-2C
C214	B-1B
C215	B-1B
C216	B-1C
C217	A-1C
C218	B-1C
C225	A-1A
C226	A-1A
C227	A-2A
C228	B-2A
C229	B-1A
C230	B-2A
C253	B-1A
C254	A-4B
C255	A-4C
L202	A-3A
L203	A-3B
L204	A-3C
L205	A-2B
L206	A-2B
L207	A-1B
L212	A-1A
L213	A-2B
L214	A-4C
CN44	B-4B

· PS2

– SIDE A –



– SIDE B –



SC82609-02-002

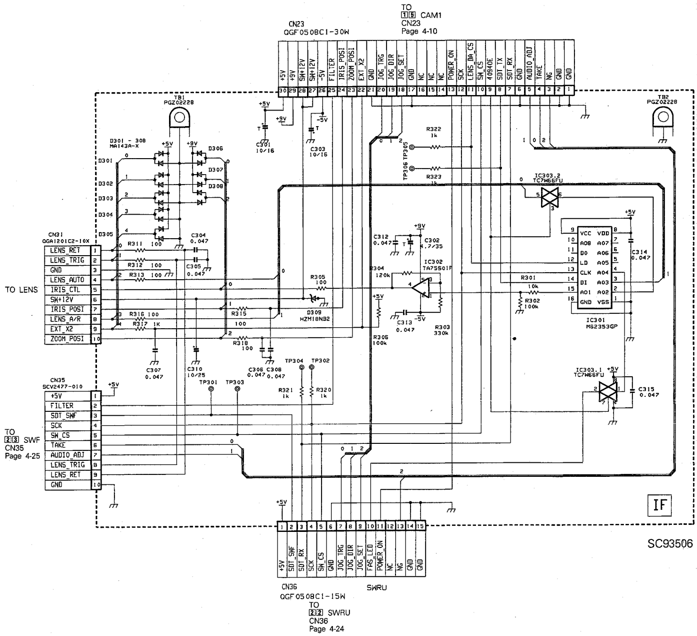
● **ADDRESS TABLE OF BOARD PARTS**
Each address may have an address error by one interval.

A-1C
Side — Y axis
X axis

IC204	B-3B
IC205	B-1B
IC211	B-2A
IC212	B-3C
IC213	B-4C
IC214	B-4C
IC215	B-4C
Q201	A-3B
Q202	A-1B
Q216	B-3C
Q221	B-3A
Q222	B-3A
Q231	A-3C
Q232	A-2C
Q235	B-2C
Q236	B-3C
Q238	B-1B
Q239	B-3A
Q240	A-2C
Q241	A-3C
Q250	A-4B
Q251	A-3C
D205	B-3B
D206	B-2A
R210	A-2B
R211	B-2B
R212	B-3B
R213	B-2B
R214	B-1B
R215	B-1B
R216	B-1B
R217	B-2A
R221	B-3B
R222	B-3B
R223	B-3B
R224	B-2B
R225	B-2B
R226	B-1A
R227	B-1A
R231	B-3A
R232	B-3A
R233	B-3A
R234	B-3A
R241	B-4C
R242	B-2C
R243	B-2C
R244	B-3C
R245	B-3C
R246	B-1B
R247	B-1A
R248	B-2C
R249	B-1A
R252	B-2B
R253	B-3A
R261	A-2C
R262	A-3C
R263	B-3C
R280	B-2B
R281	B-3B
R283	B-2B
R284	B-2B
R300	B-3A
R301	A-4B
R302	A-4B
R303	A-3B
R304	A-3C
C219	B-3B
C220	B-2C
C221	B-2C
C222	A-2A
C223	A-1A
C224	B-1B
C231	B-3B
C232	A-1B
C233	B-2B
C234	B-2A
C242	A-2A
C243	B-2A
C244	A-2C
C251	A-3C
C252	B-4C
C256	A-3A
C257	A-4A
C258	A-1B
C259	A-1C
C260	B-2B
C261	B-2B
C262	B-2C
C263	B-1C
L201	A-4A
L208	A-3B
L210	A-2B
TH201	B-4A
TH202	B-3A
TH203	B-3A
TH204	A-4C
TH205	A-4C
TH206	A-4C
TH207	A-1A
TH208	A-2C
TH209	A-4B
TH210	B-2C
CN41	A-3A
CN43	A-1C
CN44	B-4B
CN45	A-3C
CN46	A-1A
CN144	B-4B

4.13 IF(InterFace), ROM(Read Only Memory) SCHEMATIC DIAGRAM 21/19

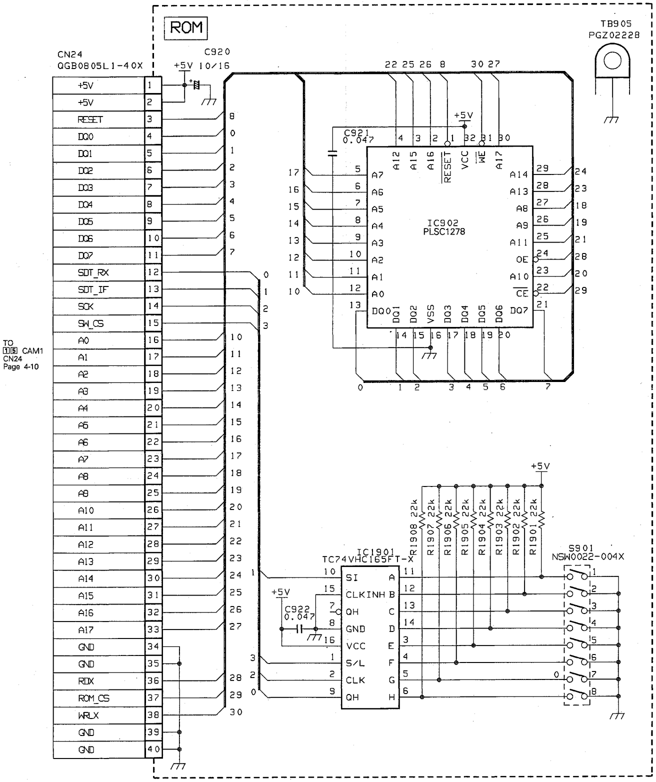
· IF 21



TO 15 CAM1 CN23 Page 4-10
CN23 QGF0508C1-30W
+5V
+9V
SW+12V
SW+12V
-5V
FILTER
IRIS_POSI
ZOOM_POSI
EXT_X2
GND
JOG_TRG
JOG_DIR
JOG_SET
GND
NC
NC
NC
POWER_ON
SCK
LENS_DA_CS
SW_CS
4094OE
SDT_TX
SDT_RX
GND
AUDIO_ADJ
TAKE
NG
GND
GND
TB1 PGZ02228
TB2 PGZ02228
D301 - 308 MA143A-X
D301
D302
D303
D304
D305
D306
D307
D308
C301 10/16
C303 10/16
R322 1k
R323 1k
TP305
TP306
IC303.2 TC7W66FU
IC302 TA75S01F
C312 0.047
C302 4.7/35
R304 120k
R305 100
D309 HZM18NB2
C313 0.047
R303 330k
R306 100k
R301 10k
R302 100k
IC301 M62353GP
C314 0.047
IC303.1 TC7W66FU
C315 0.047
CN31 QGA1201C2-10X
LENS_RET
LENS_TRIG
GND
LENS_AUTO
IRIS_CTL
SW+12V
IRIS_POSI
LENS_A/R
EXT_X2
ZOOM_POSI
TO LENS
R311 100
R312 100
R313 100
C304 0.047
C305 0.047
R316 100
R317 1K
R315 100
R318 100
C307 0.047
C310 10/25
C306 0.047
C308 0.047
TP301
TP303
TP304
TP302
R321 1k
R320 1k
CN35 SCV2477-010
+5V
FILTER
SDT_SWF
SCK
SW_CS
TAKE
AUDIO_ADJ
LENS_TRIG
LENS_RET
GND
TO 23 SWF CN35 Page 4-25
IF
CN36 QGF0508C1-15W
SWRU
+5V
SDT_SWF
SDT_RX
SCK
SW_CS
GND
JOG_TRG
JOG_DIR
JOG_SET
FAS_LED
POWER_ON
NC
NG
GND
GND
TO 22 SWRU CN36 Page 4-24

SC93506

· ROM 19



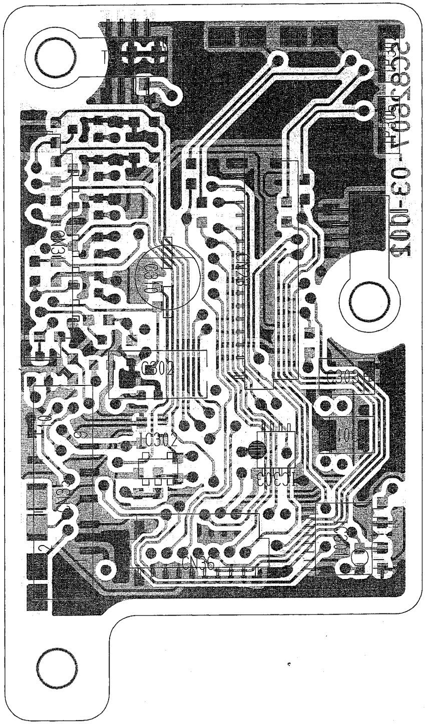
ROM
TB905 PGZ02228
CN24 QGB0805L1-40X
C920 +5V 10/16
+5V
+5V
RESET
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
SDT_RX
SDT_IF
SCK
SW_CS
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
A16
A17
GND
GND
RDX
ROM_CS
WRLX
GND
GND
TO 15 CAM1 CN24 Page 4-10
C921 0.047
IC902 PLSC1278
A7
A6
A5
A4
A3
A2
A1
A0
DQ0
DQ1
DQ2
VSS
DQ3
DQ4
DQ5
DQ6
DQ7
A12
A15
A16
RESET
VCC
WE
A17
A14
A13
A8
A9
A11
OE
A10
CE
R1908 22k
R1907 22k
R1906 22k
R1905 22k
R1904 22k
R1903 22k
R1902 22k
R1901 22k
IC1901 TC74VHC165FT-X
SI
CLKINH
QH
GND
VCC
S/L
CLK
QH
C922 0.047
S901 NSW0022-004X

SC93504

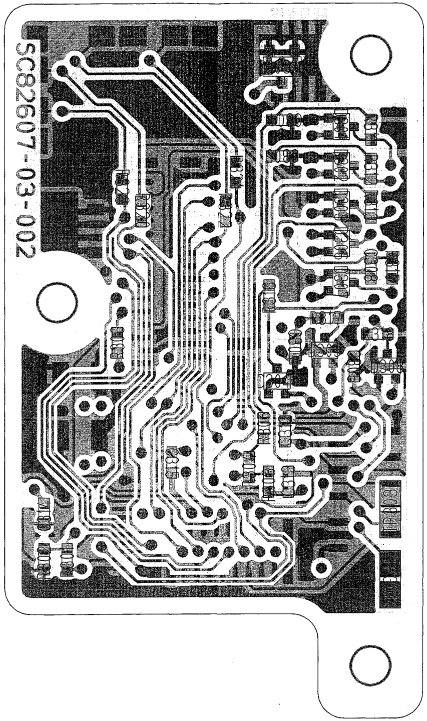
4.14 IF, ROM CIRCUIT BOARD

· IF

– SIDE A –

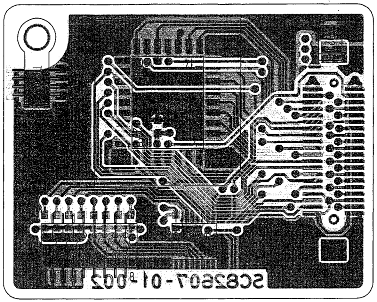

SC82607-03-001
IC302
CN36
IC303

– SIDE B –

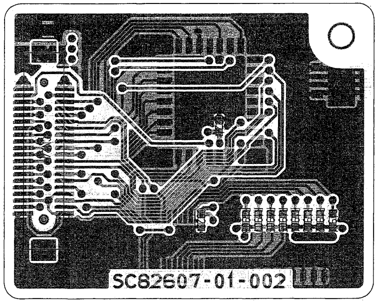

SC82607-03-002

· ROM

– SIDE A –

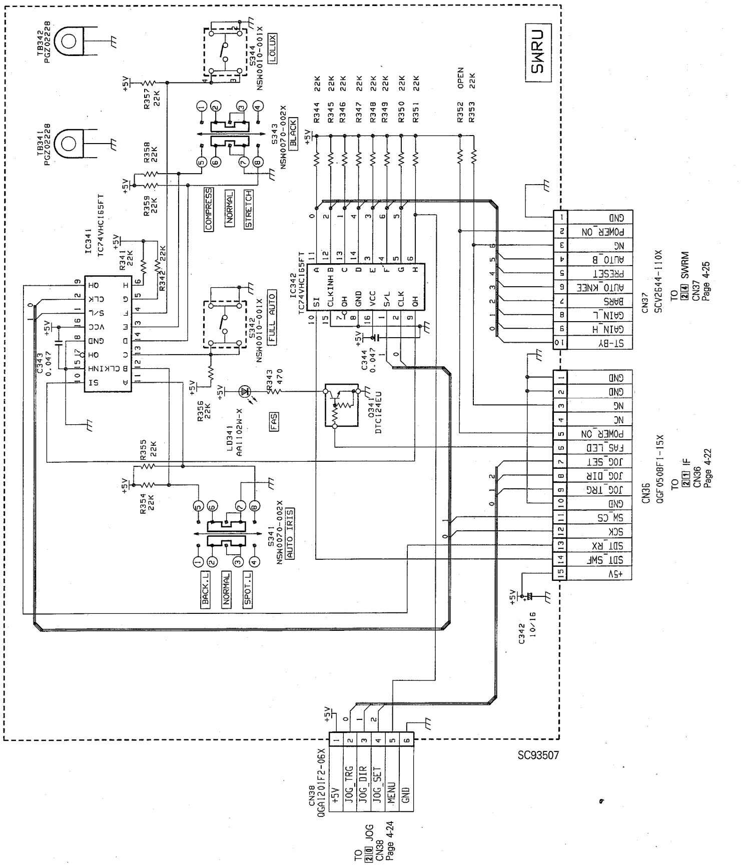

SC82607-01-002

– SIDE B –


SC82607-01-002

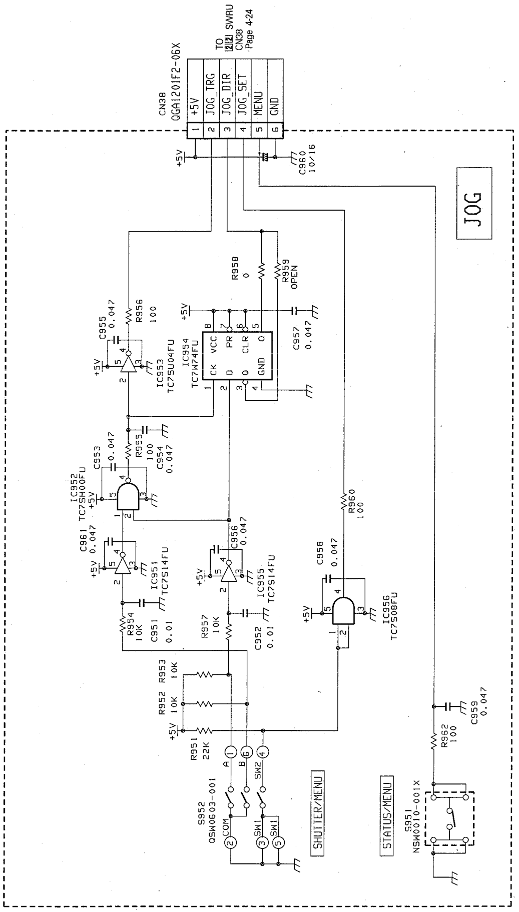
4.15 SWRU, JOG SCHEMATIC DIAGRAM 22/20

· SWRU 22


SWRU
TB342 PGZ02228
TB341 PGZ02228
S344 NSW0010-001X
LOLUX
S343 NSW0070-002X
BLACK
COMPRESS
NORMAL
STRETCH
R357 22K
R358 22K
R359 22K
IC341 TC74VHC165FT
R341 22K
R342 22K
S342 NSW0010-001X
FULL AUTO
C343 0.047
R356 22K
LD341 AA1102W-X
R343 470
FAS
Q341 DTC124EU
R355 22K
R354 22K
S341 NSW0070-002X
AUTO IRIS
BACK.L
NORMAL
SPOT.L
IC342 TC74VHC165FT
R344 22K
R345 22K
R346 22K
R347 22K
R348 22K
R349 22K
R350 22K
R351 22K
R352 OPEN
R353 22K
C344 0.047
C342 10/16
GND
POWER_ON
NG
AUTO_B
PRESET
AUTO_KNEE
BARS
GAIN_L
GAIN_H
ST-BY
CN37 SCV2644-110X
TO 24 SWRM CN37 Page 4-25
GND
GND
NG
NC
POWER_ON
FAS_LED
JOG_SET
JOG_DIR
JOG_TRG
GND
SW_CS
SCK
SDT_RX
SDT_SWF
+5V
CN36 QGF0508F1-15X
TO 21 IF CN36 Page 4-22
CN38 QGA1201F2-06X
+5V
JOG_TRG
JOG_DIR
JOG_SET
MENU
GND
TO 20 JOG CN38 Page 4-24

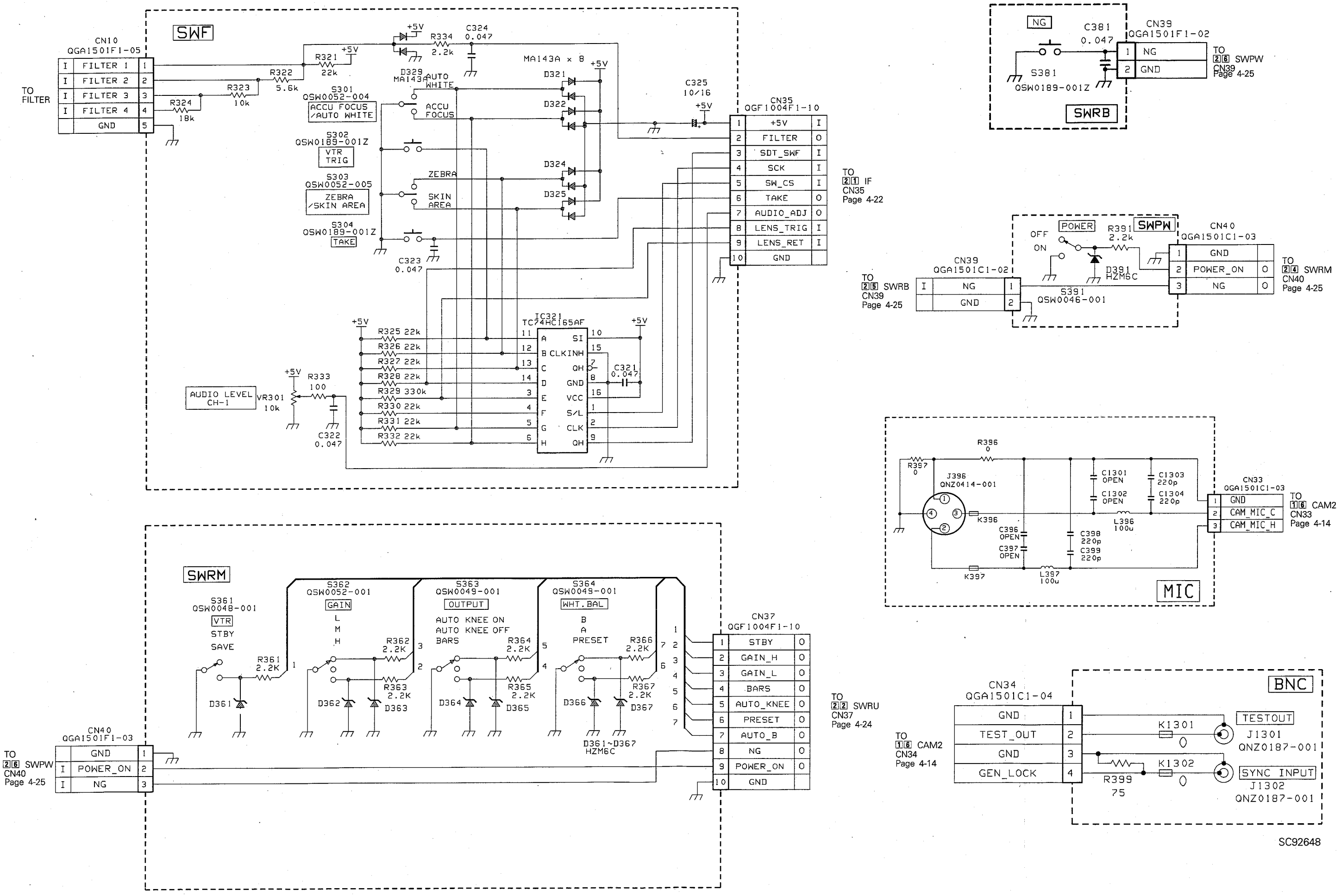
SC93507

· JOG 20


JOG
CN38 QGA1201F2-06X
+5V
JOG_TRG
JOG_DIR
JOG_SET
MENU
GND
TO 22 SWRU CN38 Page 4-24
C960 10/16
R958 0
R959 OPEN
C955 0.047
R956 100
IC953 TC75U04FU
IC954 TC7W74FU
C957 0.047
C953 0.047
R955 100
C954 0.047
IC952 TC75H00FU
C961 0.047
IC951 TC7S14FU
C956 0.047
IC955 TC7S14FU
R960 100
C958 0.047
IC956 TC7S08FU
R954 10K
C951 0.01
R957 10K
C952 0.01
R953 10K
R952 10K
R951 22K
S952 QSW0603-001
COM
SW1
SW2
SHUTTER/MENU
STATUS/MENU
S951 NSW0010-001X
R962 100
C959 0.047

SC93505

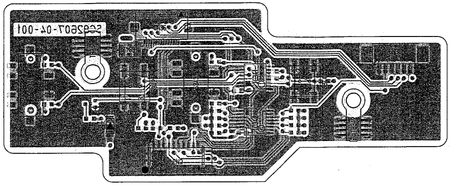
4.16 SWF, SWRM, SWRB, SWPW, MIC, BNC SCHEMATIC DIAGRAM 23/24/25/26/27/28


SWF
CN10 QGA1501F1-05
FILTER 1
FILTER 2
FILTER 3
FILTER 4
GND
TO FILTER
R321 22k
R322 5.6k
R323 10k
R324 18k
R334 2.2k
C324 0.047
MA143A x 8
D329 MA143A
S301 QSW0052-004
ACCU FOCUS /AUTO WHITE
AUTO WHITE
ACCU FOCUS
S302 QSW0189-001Z
VTR TRIG
S303 QSW0052-005
ZEBRA /SKIN AREA
ZEBRA
SKIN AREA
S304 QSW0189-001Z
TAKE
C323 0.047
D321
D322
D324
D325
C325 10/16
+5V
CN35 QGF1004F1-10
+5V
FILTER
SDT_SWF
SCK
SW_CS
TAKE
AUDIO_ADJ
LENS_TRIG
LENS_RET
GND
TO 21 IF CN35 Page 4-22
IC321 TC74HC165AF
R325 22k
R326 22k
R327 22k
R328 22k
R329 330k
R330 22k
R331 22k
R332 22k
A
B
C
D
E
F
G
H
SI
CLKINH
QH
GND
VCC
S/L
CLK
C321 0.047
AUDIO LEVEL CH-1
VR301 10k
R333 100
C322 0.047
NG
S381 QSW0189-001Z
C381 0.047
CN39 QGA1501F1-02
NG
GND
TO 26 SWPW CN39 Page 4-25
SWRB
POWER
SWPW
OFF
ON
R391 2.2k
D391 HZM6C
S391 QSW0046-001
CN39 QGA1501C1-02
TO 25 SWRB CN39 Page 4-25
CN40 QGA1501C1-03
GND
POWER_ON
NG
TO 24 SWRM CN40 Page 4-25
R396 0
R397 0
J396 QNZ0414-001
K396
K397
C1301 OPEN
C1302 OPEN
C1303 220p
C1304 220p
C396 OPEN
C397 OPEN
C398 220p
C399 220p
L396 100u
L397 100u
CN33 QGA1501C1-03
GND
CAM_MIC_C
CAM_MIC_H
TO 16 CAM2 CN33 Page 4-14
MIC
SWRM
S361 QSW0048-001
VTR
STBY
SAVE
R361 2.2K
D361
S362 QSW0052-001
GAIN
L
M
H
R362 2.2K
R363 2.2K
D362
D363
S363 QSW0049-001
OUTPUT
AUTO KNEE ON
AUTO KNEE OFF
BARS
R364 2.2K
R365 2.2K
D364
D365
S364 QSW0049-001
WHT.BAL
B
A
PRESET
R366 2.2K
R367 2.2K
D366
D367
D361~D367 HZM6C
CN37 QGF1004F1-10
STBY
GAIN_H
GAIN_L
BARS
AUTO_KNEE
PRESET
AUTO_B
NG
POWER_ON
GND
TO 22 SWRU CN37 Page 4-24
CN40 QGA1501F1-03
GND
POWER_ON
NG
TO 26 SWPW CN40 Page 4-25
BNC
CN34 QGA1501C1-04
GND
TEST_OUT
GND
GEN_LOCK
TO 16 CAM2 CN34 Page 4-14
K1301
K1302
R399 75
TESTOUT
J1301 QNZ0187-001
SYNC INPUT
J1302 QNZ0187-001
SC92648

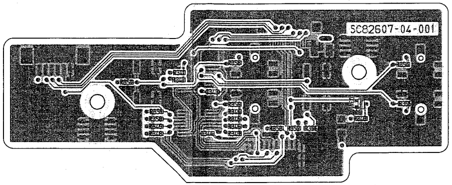
4.17 SWRU, JOG, SWF, SWRM, SWRB, SWPW, MIC, BNC, FL CIRCUIT BOARD

· SWRU

– SIDE A –

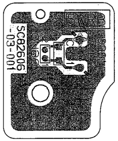

SC82607-04-001

– SIDE B –


SC82607-04-001

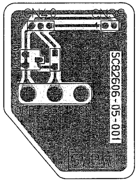
· SWRB

– SIDE B –


SC82606-03-001

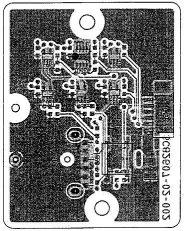
· SWPW

– SIDE B –

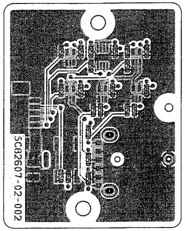

SC82606-05-001

· JOG

– SIDE A –

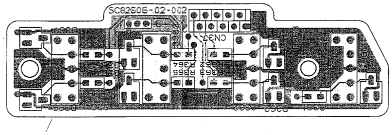


– SIDE B –


SC82607-02-002

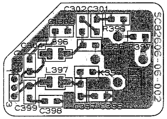
· SWRM

– SIDE B –


SC82606-02-002
CN37

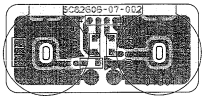
· MIC

– SIDE B –


SC82606-06-002
C302
C301
R396
R397
L397
C399
C398

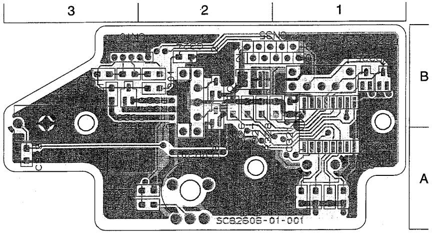
· BNC

– SIDE B –


SC82606-07-002

· SWF

– SIDE B –


3
2
1
B
A
CN10
CN35
SC82606-01-001

● ADDRESS TABLE OF BOARD PARTS

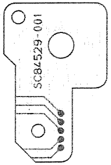
Each address may have an address error by one interval.

A-1C
Side
Y axis
X axis

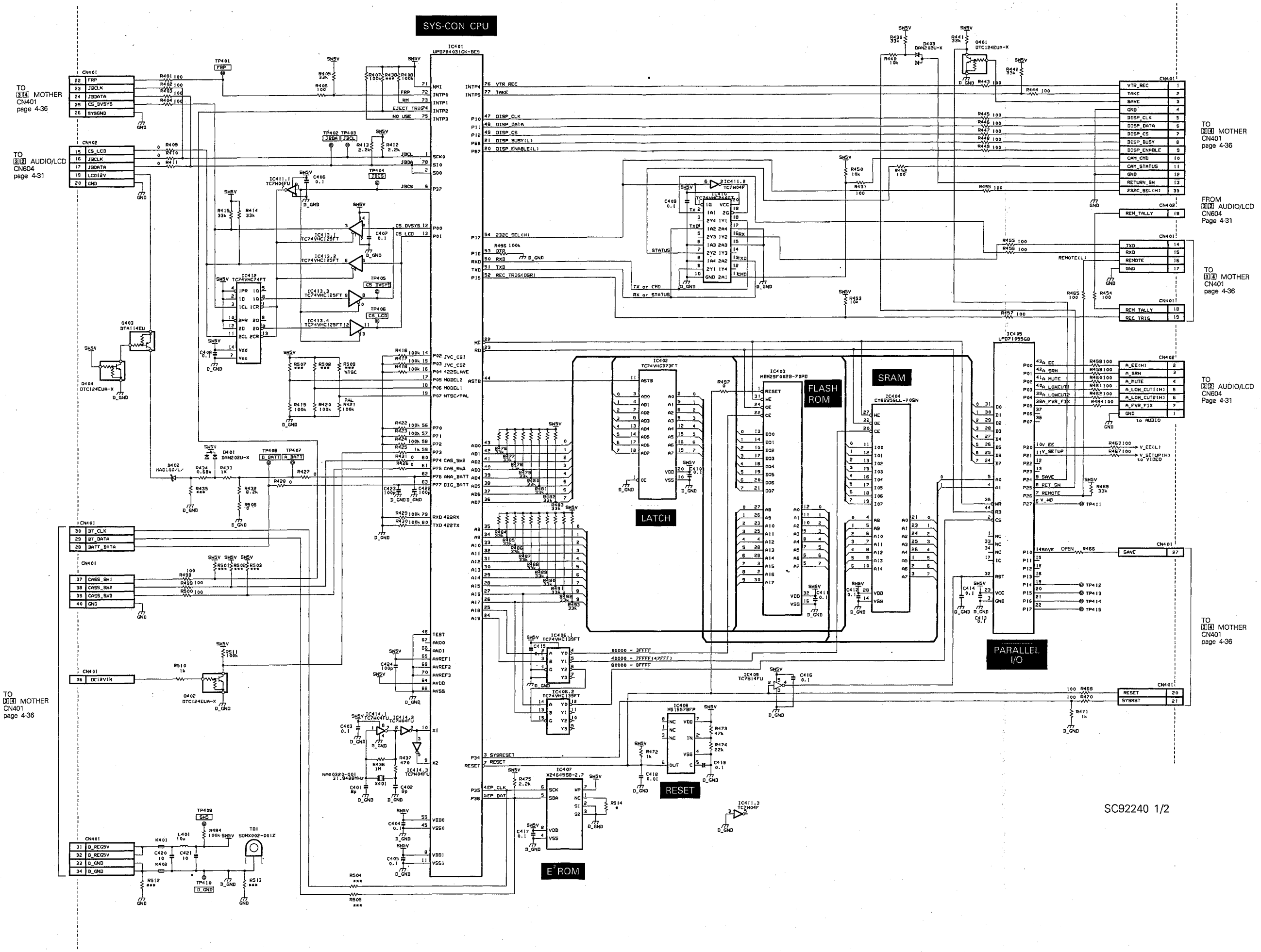
IC321	1B	R328	1B	CN10	3B
		R329	1A	CN35	2B
D321	2B	R330	1A		
D322	2B	R331	1A	S301	2B
D324	1B	R332	1A	S302	1A
D325	1B	R333	2A	S303	1B
D329	3B	R334	2B	S304	3B
R321	3B	VR301	2A		
R322	3B				
R323	3B	C321	1B		
R324	2B	C322	2A		
R325	2B	C323	3A		
R326	2B	C324	2B		
R327	2B	C325	2B		

· FL

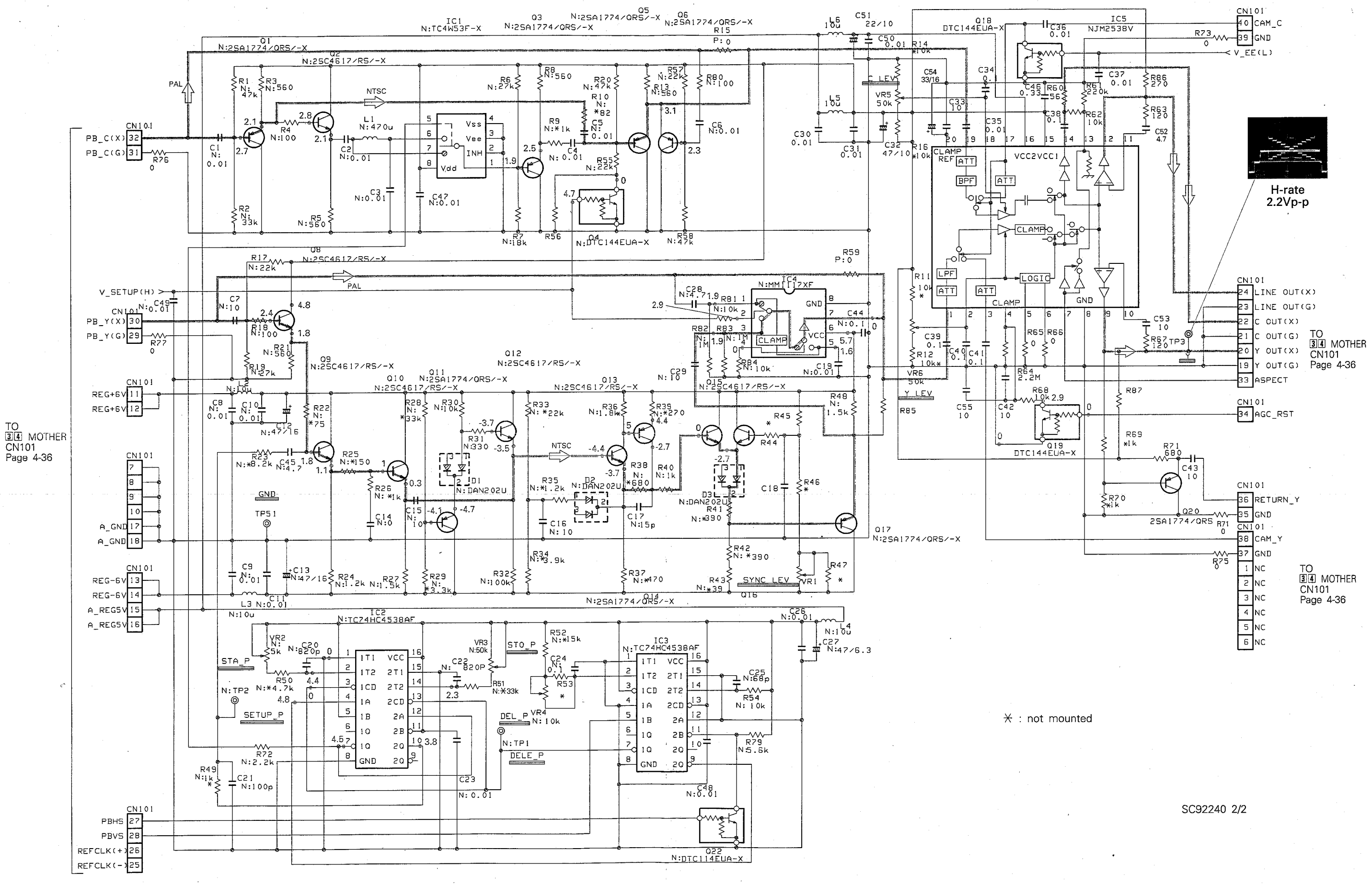
– SIDE B –


SC84529-001

4.18 VIDEO/SYSCON SCHEMATIC DIAGRAM (1/2) 3 1


SYS-CON CPU
IC401 UPD784031GK-BE9
LATCH
IC402 TC74VHC373FT
FLASH ROM
IC403 MBM29F002B-70PD
SRAM
IC404 CY62256LL-70SN
PARALLEL I/O
IC405 UPD71055GB
RESET
IC408 M51957BFP
E²ROM
IC407 X24C45S8-2.7
IC406.1 TC74VHC139FT
IC406.2 TC74VHC139FT
IC409 TC7S14FU
IC410 TC74VHC244FT
IC412 TC74VHC74FT
TO 3 4 MOTHER CN401 page 4-36
TO 3 2 AUDIO/LCD CN604 page 4-31
FROM 3 2 AUDIO/LCD CN604 Page 4-31
TO 3 2 AUDIO/LCD CN604 Page 4-31
00000 - 3FFFF
40000 - 7FFFF(47FFF)
80000 - BFFFF
X401 NAX0320-001 31.9488MHz
TB1 SQMX002-001Z
SC92240 1/2

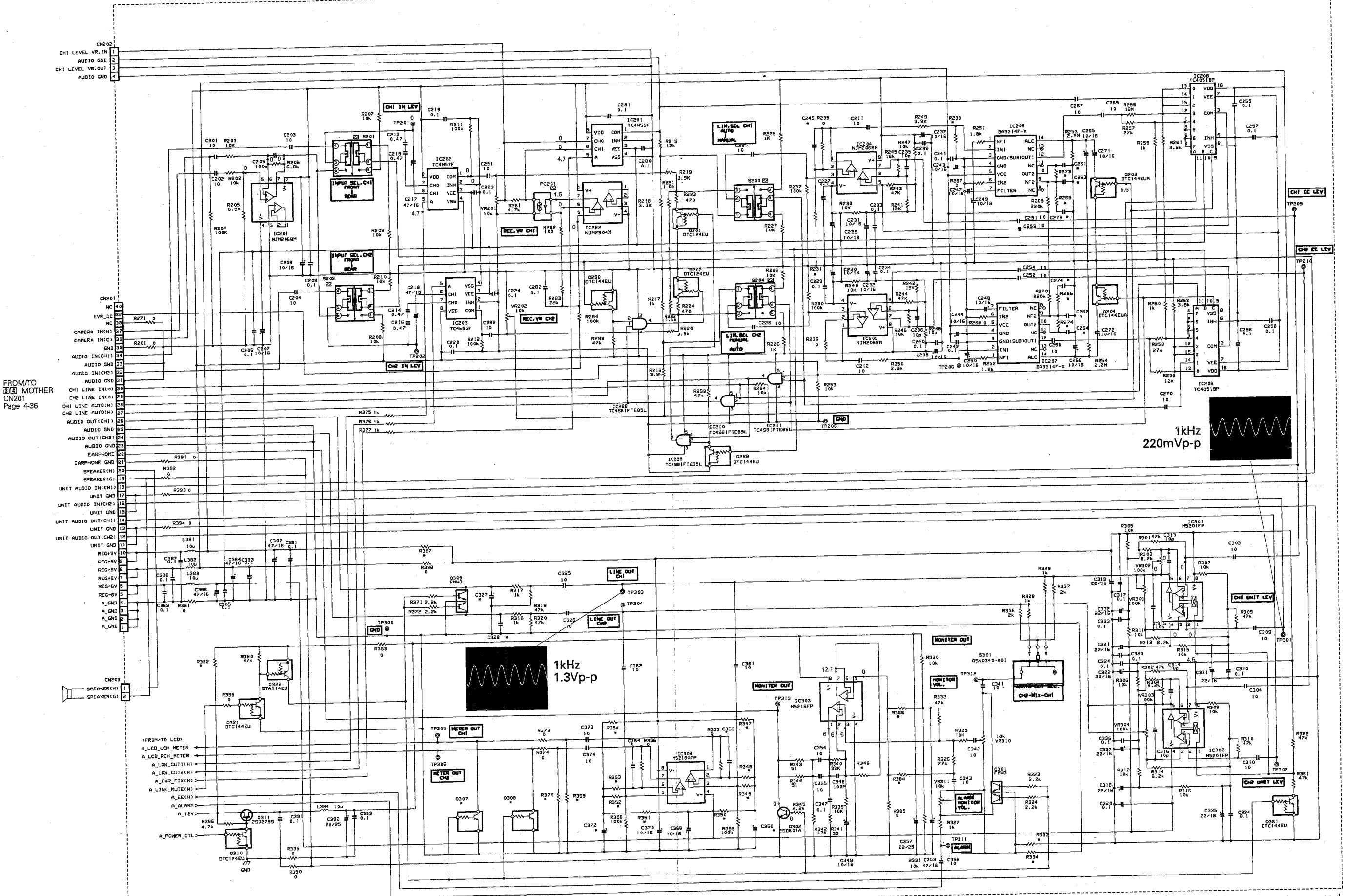
• VIDEO/SYSCON SCHEMATIC DIAGRAM (2/2) 3 1


IC1 N:TC4W53F-X
Q1 N:2SA1774/QRS/-X
Q2 N:2SC4617/RS/-X
Q3 N:2SA1774/QRS/-X
Q4 N:DTC144EUA-X
Q5 N:2SA1774/QRS/-X
Q6 N:2SA1774/QRS/-X
Q8 N:2SC4617/RS/-X
Q9 N:2SC4617/RS/-X
Q10 N:2SC4617/RS/-X
Q11 N:2SA1774/QRS/-X
Q12 N:2SC4617/RS/-X
Q13 N:2SC4617/RS/-X
Q14 N:2SA1774/QRS/-X
Q15 N:2SC4617/RS/-X
Q16
Q17 N:2SA1774/QRS/-X
Q18 DTC144EUA-X
Q19 DTC144EUA-X
Q20 2SA1774/QRS
Q22 N:DTC114EUA-X
IC2 N:TC74HC4538AF
IC3 N:TC74HC4538AF
IC4 N:MM1117XF
IC5 NJM2538V
D1 N:DAN202U
D2 N:DAN202U
D3 N:DAN202U
PAL
NTSC
CN101
PB_C(X) 32
PB_C(G) 31
V_SETUP(H)
PB_Y(X) 30
PB_Y(G) 29
REG+6V 11
REG+6V 12
7
8
9
10
A_GND 17
A_GND 18
REG-6V 13
REG-6V 14
A_REG5V 15
A_REG5V 16
PBHS 27
PBVS 28
REFCLK(+) 26
REFCLK(-) 25
40 CAM_C
39 GND
V_EE(L)
24 LINE OUT(X)
23 LINE OUT(G)
22 C OUT(X)
21 C OUT(G)
20 Y OUT(X)
19 Y OUT(G)
33 ASPECT
34 AGC_RST
36 RETURN_Y
35 GND
38 CAM_Y
37 GND
1 NC
2 NC
3 NC
4 NC
5 NC
6 NC
TO 34 MOTHER CN101 Page 4-36
TO 34 MOTHER CN101 Page 4-36
TO 34 MOTHER CN101 Page 4-36
H-rate 2.2Vp-p
TP3
TP51
N:TP1
N:TP2
GND
C LEV
Y LEV
SYNC LEV
STA_P
STO_P
SETUP_P
DEL_P
DELE_P
VR1
VR2 N:5k
VR3 N:50k
VR4 N:10k
VR5 50k
VR6 50k
CLAMP REF
ATT
BPF
LPF
CLAMP
LOGIC
VCC2VCC1
Vss
Vee
INH
Vdd
1T1 VCC
1T2 2T1
1CD 2T2
1A 2CD
1B 2A
1Q 2B
1Q 2Q
GND 2Q
L1 N:470u
L2
L3 N:10u
L4 N:10u
L5 10u
L6 10u
C51 22/10
C36 0.01
C37 0.01
C43 10
C53 10
C52 4.7
R73 0
R71 0
R75 0
R76 0
R77 0
R15 P:0
R59 P:0
R86 270
R63 120
R67 120
R71 680

※ : not mounted

SC92240 2/2

4.20 AUDIO/LCD SCHEMATIC DIAGRAM (1/2) 3 2

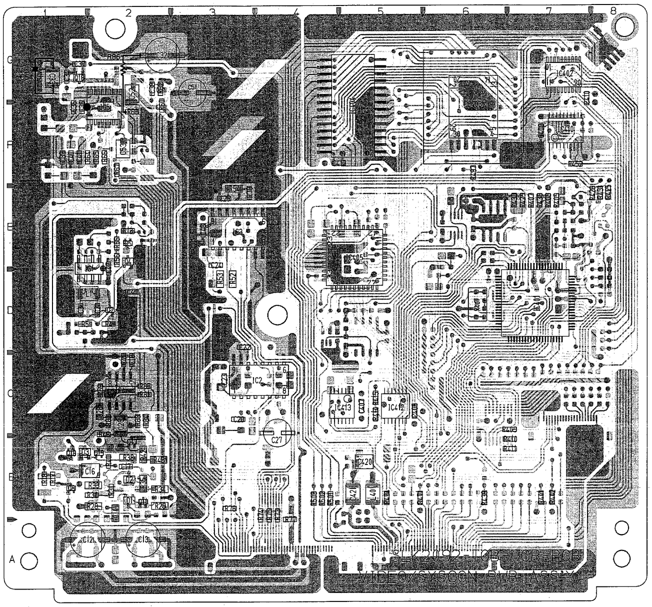

CN202
CH1 LEVEL VR.IN
AUDIO GND
CH1 LEVEL VR.OUT
AUDIO GND
CN201
NC
EVR_DC
NC
CAMERA IN(H)
CAMERA IN(C)
GND
AUDIO IN(CH1)
AUDIO GND
AUDIO IN(CH2)
AUDIO GND
CH1 LINE IN(H)
CH2 LINE IN(H)
CH1 LINE AUTO(H)
CH2 LINE AUTO(H)
AUDIO OUT(CH1)
AUDIO GND
AUDIO OUT(CH2)
AUDIO GND
EARPHONE
EARPHONE GND
SPEAKER(H)
SPEAKER(G)
UNIT AUDIO IN(CH1)
UNIT GND
UNIT AUDIO IN(CH2)
UNIT GND
UNIT AUDIO OUT(CH1)
UNIT GND
UNIT AUDIO OUT(CH2)
UNIT GND
REG+5V
REG+8V
REG+8V
REG+6V
REG-6V
REG-6V
A_GND
A_GND
A_GND
A_GND
FROM/TO
3 4 MOTHER
CN201
Page 4-36
CN203
SPEAKER(H)
SPEAKER(G)
CH1 IN LEV
INPUT SEL.CH1 FRONT REAR
INPUT SEL.CH2 FRONT REAR
CH2 IN LEV
IC201 NJM2068M
IC202 TC4W53F
IC203 TC4W53F
IC281 TC4W53F
IC282 NJM2904M
REC.VR CH1
REC.VR CH2
LIM.SEL CH1 AUTO MANUAL
LIM.SEL CH2 MANUAL AUTO
IC204 NJM2068M
IC205 NJM2068M
IC206 BA3314F-X
IC207 BA3314F-X
IC208 TC4051BP
IC209 TC4051BP
IC210 TC4S81FTE85L
IC211 TC4S81FTE85L
IC298 TC4S81FTE85L
IC299 TC4S81FTE85L
Q201 DTC124EU
Q202 DTC124EU
Q203 DTC144EUA
Q204 DTC144EUA
Q298 DTC144EU
Q299 DTC144EU
CH1 EE LEV
CH2 EE LEV
TP208
TP210
1kHz
220mVp-p
IC301 M5201FP
IC302 M5201FP
IC303 M5216FP
IC304 M5218AFP
CH1 UNIT LEV
CH2 UNIT LEV
LINE OUT CH1
LINE OUT CH2
METER OUT CH1
METER OUT CH2
MONITOR OUT
MONITOR VOL.
ALARM MONITOR VOL.
ALARM
S301 QSW0340-001
AUDIO OUT SEL. CH2-MIX-CH1
1kHz
1.3Vp-p
Q321 DTC144EU
Q322 DTA114EU
Q310 DTC124EU
Q311 2SJ279S
Q302 2SD601A
Q351 DTC144EU
Q301 FMW3
Q309 FMW3
(FROM/TO LCD)
A_LCD_LCH_METER
A_LCD_RCH_METER
A_LOW_CUT1(H)
A_LOW_CUT2(H)
A_FVR_FIX(H)
A_LINE_MUTE(H)
A_EE(H)
A_ALARM
A_12V
A_POWER_CTL
GND

※ marked parts are not mounted.

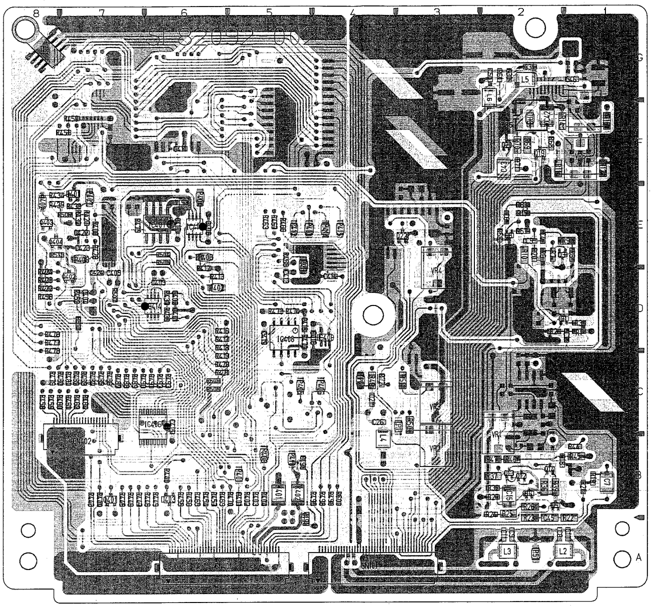
SL92237 1/2

4.19 VIDEO/SYSCON CIRCUIT BOARD

– SIDE A –



– SIDE B –



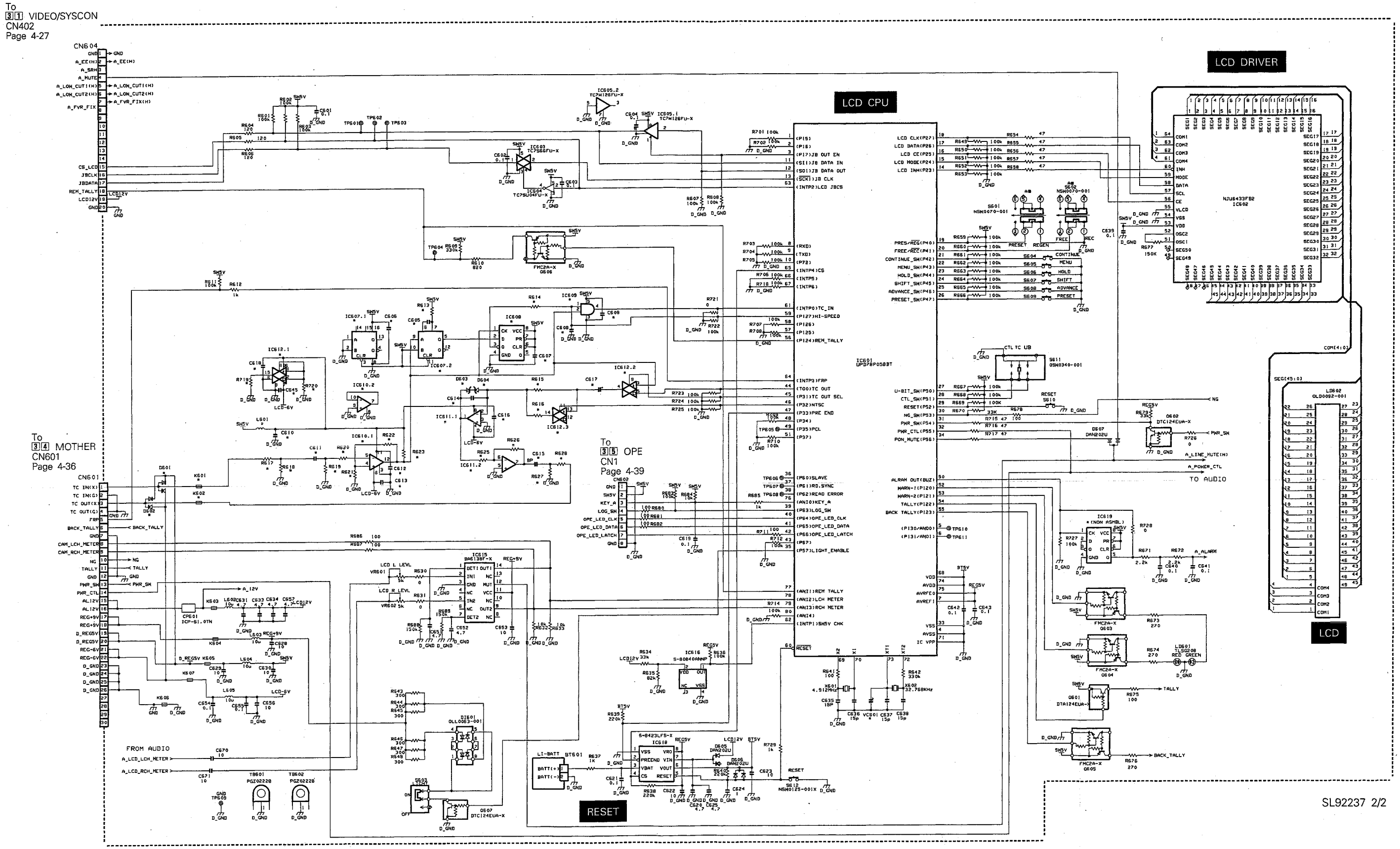
● **ADDRESS TABLE OF BOARD PARTS**

Each address may have an address error by one interval.

A-1C
Side — Y axis
X axis

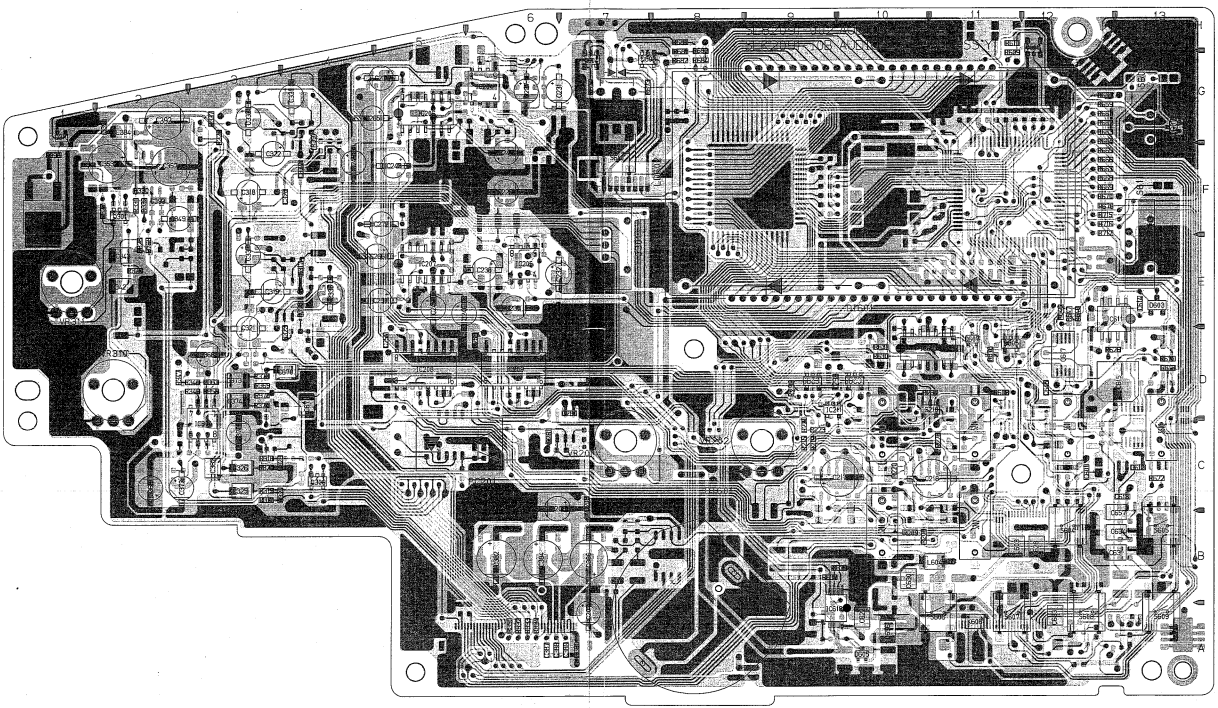
IC1	A-2E	Q9	B-2B	R3	B-1D	R30	A-2B	R57	B-2E	R85	A-2C	R427	B-7E	R454	B-6B	R481	B-8C	R508	B-6C	C13	A-2A	C40	A-1F	C414	B-4D	TP404	B-6E
IC2	A-3C	Q10	B-2B	R4	A-2D	R31	A-2B	R58	B-2E	R401	B-6B	R428	B-7E	R455	B-6B	R482	B-8C	R509	B-6C	C14	A-2B	C41	A-1F	C415	B-6C	TP405	B-5C
IC3	A-3E	Q11	A-2B	R5	A-1D	R32	B-2B	R59	A-2C	R402	B-5B	R429	A-7E	R456	B-6B	R483	B-7C	R510	B-8D	C15	B-2B	C42	B-2F	C416	B-5D	TP406	B-5C
IC4	A-2C	Q12	B-2B	R6	B-2E	R33	A-2B	R60	A-2F	R403	B-5B	R430	A-7E	R457	B-6B	R484	B-7C	R511	B-8E	C16	A-2B	C43	B-2F	C417	B-6E	TP407	B-7E
IC5	A-2F	Q13	B-2B	R7	B-2E	R34	A-2B	R61	B-2G	R404	B-5B	R431	A-8E	R458	B-8C	R485	B-7C	R512	B-5A	C17	A-2B	C44	A-2C	C418	B-5D	TP408	B-8E
IC401	A-7D	Q14	B-2B	R8	B-1E	R35	A-2B	R62	A-2G	R405	A-7E	R432	B-8E	R459	B-8C	R486	B-7C	R513	B-5B	C18	B-2B	C45	B-2B	C419	B-5D	TP409	B-5B
IC402	A-8G	Q15	A-2B	R9	B-1E	R36	B-2B	R63	A-2F	R406	B-7E	R433	B-8E	R460	B-8C	R487	B-7C	R514	B-6E	C19	A-2C	C46	B-1G	C420	A-5B	TP410	B-5B
IC403	A-6F	Q16	A-1B	R10	B-2E	R37	B-2B	R64	A-2F	R407	A-7E	R434	B-8E	R461	B-8C	R488	B-7C			C20	A-3C	C47	A-2E	C421	A-5B	TP411	B-5E
IC404	A-5F	Q17	A-2B	R11	B-2F	R38	A-2B	R65	A-2F	R408	A-7E	R435	B-8E	R462	B-8C	R489	B-7C	VR1	B-2C	C21	B-4C	C48	A-3E	C422	B-8E	TP412	B-5E
IC405	A-5E	Q18	A-1G	R12	B-1F	R39	B-2B	R66	A-2F	R409	A-7C	R436	B-6D	R463	B-5E	R490	B-7C	VR2	B-3B	C22	A-3D	C49	A-2D	C423	B-8E	TP413	B-5E
IC406	B-7C	Q19	B-2F	R13	A-2E	R40	A-2B	R67	A-2F	R410	A-7B	R437	B-6D	R464	B-7C	R491	B-7C	VR3	B-3C	C23	A-3C	C50	B-2G	C424	B-7D	TP414	B-4E
IC407	B-7E	Q20	B-2F	R14	B-2F	R41	A-2B	R68	B-2F	R411	A-7B	R438	A-7E	R465	B-6B	R492	B-7C	VR4	B-3E	C24	A-3E	C51	A-3G			TP415	B-4E
IC408	B-5D	Q22	B-3E	R15	B-2E	R42	A-2B	R69	B-2F	R412	B-6E	R439	A-6B	R466	B-5E	R493	B-6C	VR5	B-1F	C25	A-3E	C52	A-2G	L1	A-2D		
IC409	B-4D	Q401	B-7B	R16	B-1F	R43	A-2B	R70	B-2F	R413	B-6D	R440	B-6B	R467	B-5E	R494	A-5B	VR6	B-1F	C26	B-4C	C53	A-2F	L2	B-2A	TB1	B-8G
IC410	A-7F	Q402	B-8D	R17	A-1B	R44	B-1B	R71	B-2F	R414	A-5C	R441	A-7B	R468	B-5E	R495	B-5B			C27	A-4C	C401	B-6D	L3	B-2A		
IC411	B-6E	Q403	B-8E	R18	A-1B	R45	B-1B	R72	B-4C	R415	A-5C	R442	A-7B	R469	B-6B	R496	B-8D	C1	B-1D	C28	A-2C	C402	B-6D	L4	B-4B	CN101	B-4A
IC412	A-6C	Q404	B-8E	R19	B-1B	R46	B-2B	R73	A-4B	R416	B-6D	R443	B-7B	R470	B-6B	R497	A-6F	C2	A-2D	C29	A-2C	C403	B-7D	L5	B-2G	CN401	B-6A
IC413	A-5C			R20	B-2E	R47	B-2B	R74	A-4B	R417	B-6D	R444	B-7B	R471	A-6B	R498	B-5B	C3	A-1D	C30	B-2G	C404	B-7D	L6	B-2G	CN402	B-8B
IC414	B-7D	D1	A-2B	R21	B-1B	R48	A-2C	R75	A-4B	R418	B-6D	R445	B-7B	R472	B-5D	R499	B-4B	C4	B-2E	C31	B-2G	C405	B-7D	L401	A-5B		
		D2	A-2B	R22	B-1B	R49	B-4C	R76	A-3B	R419	B-6C	R446	B-7B	R473	B-5D	R500	B-4B	C5	B-2E	C32	A-2G	C406	B-6E			X401	A-6D
Q1	B-2D	D3	A-1B	R23	B-2B	R50	B-3C	R77	A-4A	R420	B-6C	R447	B-7B	R474	B-5D	R501	A-5B	C6	B-2E	C33	A-1G	C407	A-5C	TP1	B-4C		
Q2	A-2D	D401	B-8E	R24	B-2B	R51	B-3C	R79	A-4E	R421	B-6C	R448	B-7B	R475	B-7E	R502	A-4B	C7	B-1B	C34	A-1G	C408	A-6C	TP2	B-4C	K401	B-5B
Q3	B-2E	D402	B-8E	R25	B-2B	R52	A-3D	R80	B-2E	R422	B-8D	R449	B-7B	R476	B-8D	R503	A-4B	C8	B-2A	C35	A-1F	C409	A-7F	TP3	B-2F	K402	B-5B
Q4	A-2E	D403	B-6B	R26	B-2B	R53	A-3D	R81	A-2C	R423	B-8D	R450	B-8F	R477	B-8D	R504	B-6E	C9	B-2A	C36	A-1F	C410	A-8G	TP51	B-2A		
Q5	A-2E			R27	B-2B	R54	A-3E	R82	A-2C	R424	B-8D	R451	B-8F	R478	B-8D	R505	B-6E	C10	B-1A	C37	A-1G	C411	B-6F	TP401	B-6B		
Q6	B-2E	R1	B-1D	R28	A-2B	R55	A-2E	R83	A-2C	R425	A-8E	R452	A-8F	R479	B-8C	R506	B-8E	C11	B-2A	C38	A-2G	C412	A-5F	TP402	B-6D		
Q8	A-1B	R2	B-2D	R29	A-2B	R56	A-2E	R84	A-2C	R426	A-8E	R453	B-8D	R480	B-8C	R507	B-7D	C12	A-2A	C39	A-1F	C413	B-5D	TP403	B-6E		

· AUDIO/LCD SCHEMATIC DIAGRAM (2/2)③②


To
③① VIDEO/SYSCON
CN402
Page 4-27
CN604
LCD CPU
LCD DRIVER
IC601
UPD78P058BT
NJU6433FB2
IC602
To
③④ MOTHER
CN601
Page 4-36
CN601
To
③⑤ OPE
CN1
Page 4-39
CN602
TO AUDIO
FROM AUDIO
RESET
LCD
LD602
SL92237 2/2

4.21 AUDIO/LCD CIRCUIT BOARD

– SIDE A –

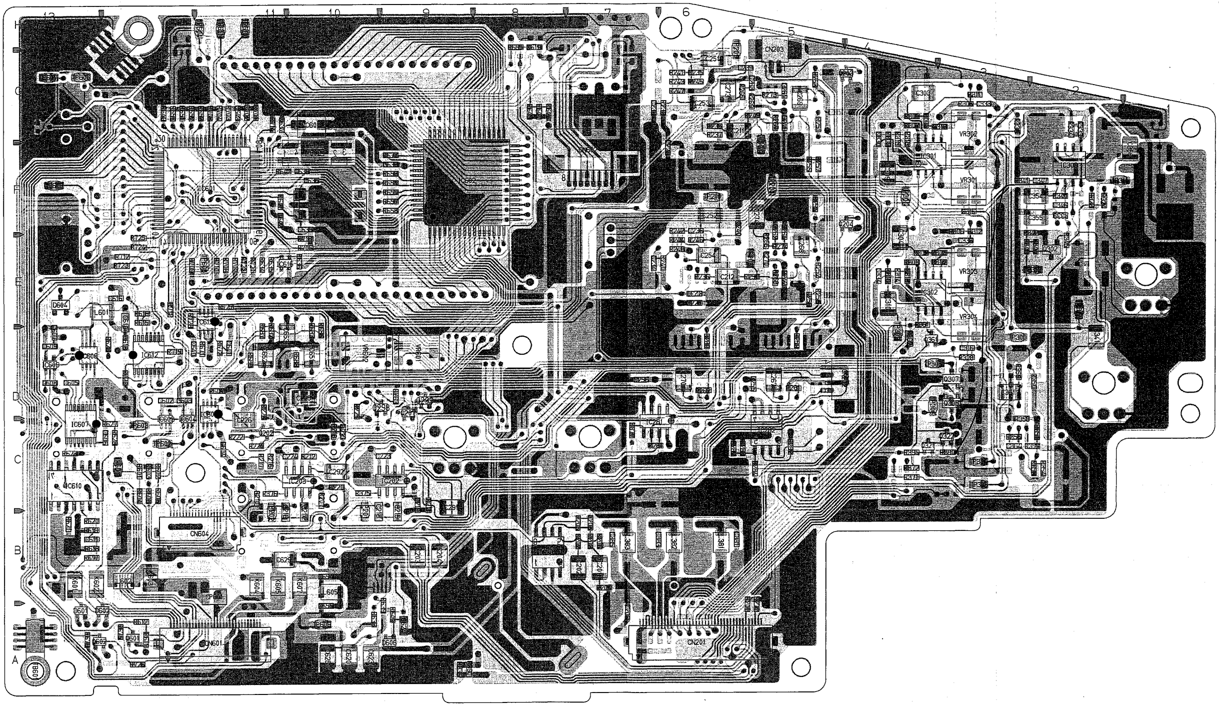


- **ADDRESS TABLE OF BOARD PARTS**
  Each address may have an address error by one interval.

A-1C
Side —┘ | └— Y axis
└——— X axis

IC201	B-8B	IC601	B-11F	Q204	B-4F	Q607	A-13G	R210	B-11C	R236	B-6E	R256	B-5E	R282	B-5C	R315	B-4G	R336	B-3G	R356	B-3C	R393	A-6A	R614	A-13D	R635	B-11E	R654	B-9F	R673	A-7G	R703	B-11G	R723	B-12E
IC202	B-9C	IC602	B-9F	Q298	B-9D			R211	B-9C	R237	B-6G	R257	B-5G	R283	B-6C	R316	B-4E	R337	A-3G	R358	B-3D	R394	A-6A	R615	B-12E	R636	B-10E	R655	B-9F	R674	A-7G	R704	B-11G	R724	B-12F
IC203	B-10C	IC603	B-12D	Q299	B-9D	D601	B-13B	R212	B-10C	R239	B-6G	R258	B-5E	R284	B-5C	R317	A-3C	R339	B-2F	R359	B-3D	R395	B-4C	R616	B-12E	R637	A-9B	R656	B-9F	R675	B-12A	R705	B-11G	R725	B-12F
IC204	A-6G	IC604	B-12D	Q301	A-2F	D602	B-13B	R215	A-9C	R240	B-6E	R259	B-5E	R298	A-9D	R318	A-3C	R340	B-2F	R361	B-4E	R396	A-1G	R617	B-13B	R638	B-10A	R657	B-9F	R676	A-11D	R706	B-10F	R726	B-12A
IC205	A-6F	IC605	B-11D	Q302	B-2F	D603	A-13E	R216	B-11C	R241	B-6H	R260	B-6E	R299	A-9D	R319	A-3C	R341	B-3F	R362	B-4E	R397	A-4G	R618	B-13B	R639	B-9B	R658	B-9F	R677	B-9G	R707	B-11E	R727	B-11E
IC206	A-5G	IC607	B-13D	Q307	B-3D	D604	B-13E	R217	B-11C	R242	B-6F	R261	B-5D	R301	B-4G	R320	A-3C	R342	B-2F	R369	A-3D	R398	A-4E	R619	B-13B	R640	B-9A	R659	A-12G	R678	A-12F	R708	B-11E	R728	B-12E
IC207	A-5F	IC608	B-13D	Q308	B-3D	D605	A-10A	R218	B-10D	R243	B-6G	R262	B-6D	R302	B-4F	R323	B-2F	R343	B-3F	R370	A-3D	R601	B-12C	R620	B-13C	R641	B-11F	R660	A-12G	R679	B-13A	R709	B-12E		
IC208	A-5D	IC609	B-13D	Q309	A-4C	D606	B-9A	R219	A-9C	R244	B-6F	R263	B-9D	R303	B-4G	R324	B-2F	R344	B-2F	R371	B-4C	R602	B-12C	R621	B-13C	R642	B-11F	R661	A-12G	R680	A-8H	R710	B-11E	VR201	A-7C
IC209	A-6D	IC610	B-13C	Q310	A-1G	D607	A-11E	R220	A-10C	R245	B-6G	R264	A-11D	R304	B-3F	R325	A-2E	R345	B-2F	R372	B-4C	R603	B-12C	R622	A-13C	R643	B-8G	R662	A-12G	R681	A-8H	R711	B-12E	VR202	A-9C
IC210	A-11D	IC611	A-12E	Q311	A-1F			R221	A-9D	R246	B-6F	R265	B-6G	R305	B-3G	R326	A-2F	R346	A-2F	R373	A-3D	R604	B-12C	R623	B-13C	R644	B-8G	R663	A-12G	R682	A-8H	R712	B-12F	VR301	B-3F
IC211	A-9D	IC612	B-12D	Q321	B-4C	R201	B-6B	R222	B-11C	R247	B-6G	R266	B-5F	R306	B-3F	R327	A-2F	R347	A-2D	R374	A-3D	R605	B-12C	R625	B-12E	R645	B-8G	R664	A-12G	R683	A-8H	R714	B-11G	VR302	B-3G
IC281	B-7D	IC615	A-10E	Q322	B-3C	R202	B-7B	R223	A-9D	R248	B-6F	R267	B-5G	R307	B-4G	R328	B-3D	R348	A-3D	R375	B-10C	R606	B-12C	R626	A-12D	R646	A-12E	R665	A-12G	R684	A-8H	R715	A-12F	VR303	B-3E
IC282	B-5D	IC616	B-11E	Q361	B-4E	R203	B-7B	R224	B-11C	R249	B-5G	R268	B-5E	R308	B-4E	R329	A-3G	R349	A-3D	R376	B-11C	R607	B-11D	R627	B-12D	R647	A-12E	R666	A-12G	R685	B-8H	R716	A-12F	VR304	B-3E
IC298	A-10D	IC618	A-10B	Q601	B-12A	R204	B-7B	R225	B-10D	R250	B-6E	R269	B-6G	R309	B-4G	R330	A-2F	R350	B-2D	R377	B-7D	R608	A-11D	R628	B-12C	R648	A-12E	R667	A-12G	R686	B-10E	R717	A-12F	VR310	A-2D
IC299	A-9D	IC619	B-11E	Q602	B-13A	R205	B-7B	R226	B-11D	R251	B-5G	R270	B-5E	R310	B-4E	R331	A-2F	R351	B-2C	R380	B-3C	R609	A-11H	R630	A-10D	R649	B-12G	R668	A-12F	R687	B-11E	R718	B-10F	VR311	A-1E
IC301	B-4G			Q603	A-7H	R206	B-7C	R227	B-10D	R252	B-5E	R271	B-5B	R311	B-3G	R332	A-2F	R352	B-2C	R381	A-7A	R610	A-11H	R631	A-10E	R650	B-12G	R669	A-12F	R688	B-10D	R719	B-12D	VR601	B-9D
IC302	B-4E	Q201	B-9D	Q604	A-7H	R207	B-10C	R228	A-11C	R253	B-5H	R273	B-5G	R312	B-3F	R333	B-2G	R353	B-2C	R390	B-9A	R611	B-12A	R632	B-11E	R651	B-12G	R670	A-12F	R689	B-11D	R720	B-12D	VR602	B-10D
IC303	B-2G	Q202	B-11D	Q605	A-11E	R208	A-10B	R230	B-6E	R254	B-5F	R274	B-5F	R313	B-4G	R334	B-2G	R354	B-2C	R391	A-6A	R612	B-12A	R633	B-10E	R652	B-12G	R671	B-11D	R701	B-11G	R721	B-11E		
IC304	A-3D	Q203	B-4H	Q606	A-12H	R209	A-10B	R235	B-6G	R255	B-5G	R281	B-7C	R314	B-4E	R335	B-9A	R355	A-3D	R392	A-6A	R613	A-13D	R634	B-11E	R653	B-11G	R672	B-11D	R702	B-11G	R722	B-11E	C201	B-7B

– SIDE B –



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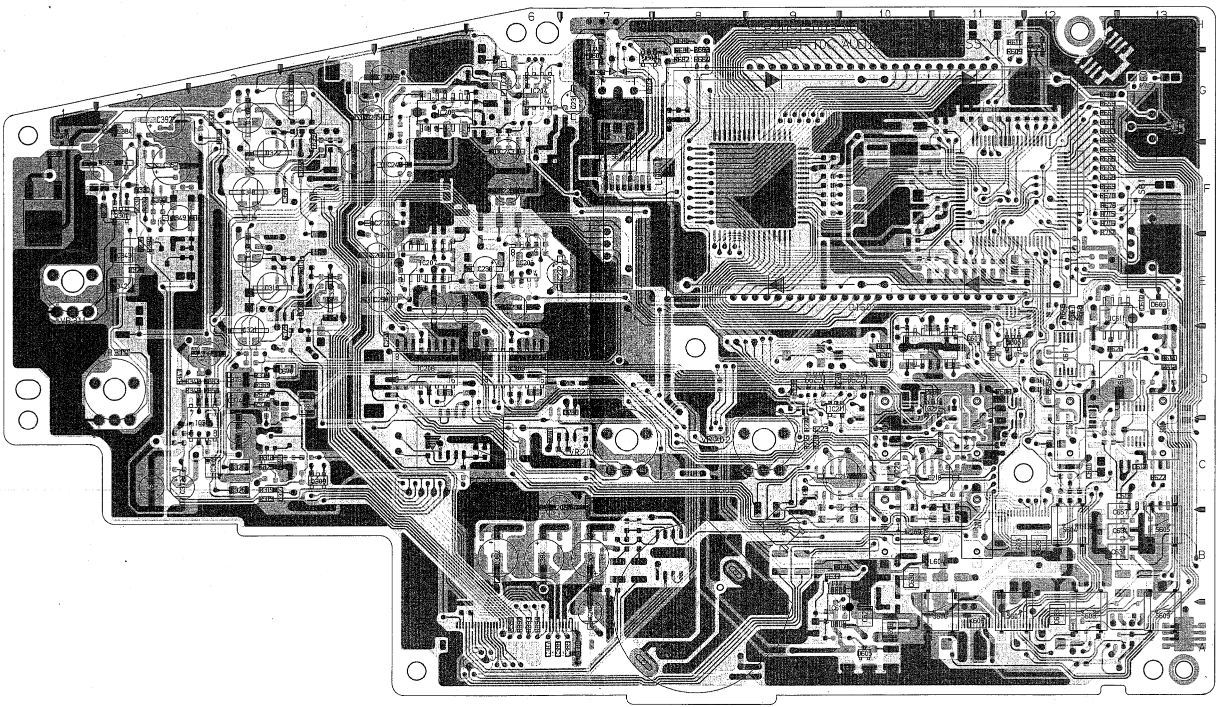
C203	B-9B	C225	B-10D	C244	A-5E	C267	B-5D	C315	B-3F	C335	A-4E	C368	A-2C	C603	B-12D	C622	A-10A	C645	A-12D	L603	A-11B	TP312	B-2E	CN203	B-5H	S608	A-12B		
C204	B-9B	C226	B-11D	C247	A-6G	C268	B-5F	C316	B-3D	C336	B-3F	C370	A-3D	C604	B-11C	C623	B-10A	C651	B-10D	L604	A-11B	TP313	B-2E	CN601	B-11A	S609	A-13B	DI601	A-10F
C205	B-7C	C227	B-6E	C248	A-5E	C269	B-5G	C317	A-4E	C337	A-3F	C372	A-2C	C605	B-13D	C624	B-9A	C652	B-11D	L605	B-10B	TP601	B-12C	CN602	B-7G	S610	A-7G		
C206	B-7A	C228	B-6G	C249	A-4G	C270	B-6D	C318	A-3F	C341	B-2E	C373	A-3D	C606	B-12C	C625	B-10A	C653	B-11E			TP602	B-12C	CN604	B-11B	S611	A-13F	PC201	A-5C
C207	A-7B	C229	A-6F	C250	A-5E	C271	A-5H	C319	A-3E	C342	A-2E	C374	A-3D	C607	B-13E	C628	A-12B	C654	B-10B	TP200	B-5F	TP603	B-12D						
C208	A-7C	C230	A-6E	C251	B-6H	C272	A-5F	C320	A-4F	C343	A-2F	C381	B-6B	C608	B-13D	C629	B-11B	C655	B-10B	TP201	B-10C	TP604	B-11H	CP601	B-11B	X601	B-10F		
C209	A-6C	C231	A-7G	C252	B-6F	C273	B-6G	C321	A-3E	C346	B-2F	C382	A-6B	C609	B-13E	C630	A-10B	C656	A-10A	TP202	B-11C	TP605	B-11E			X602	B-10G		
C211	B-6G	C232	A-7E	C253	B-6G	C274	B-5F	C322	A-3G	C347	B-2F	C383	B-7B	C610	B-12E	C631	A-13B	C657	A-13C	TP205	B-5G	TP606	B-13H	S201	A-10C				
C212	B-6E	C233	B-7G	C254	B-6F	C280	A-7D	C323	A-4E	C349	A-2F	C384	A-6B	C611	B-13B	C633	A-12A	C670	A-4D	TP206	B-6F	TP607	B-13H	S202	A-11C	K601	B-13B		
C213	B-10C	C234	B-7E	C255	B-5D	C281	A-6C	C324	A-4G	C353	A-2G	C385	B-7B	C612	A-13C	C634	A-13B	C671	A-4D	TP209	B-6H	TP608	B-13F	S203	A-10D	K602	B-13B		
C214	B-10C	C235	B-6H	C256	B-7D	C282	B-6C	C325	A-3C	C354	B-2F	C386	A-7B	C613	A-13C	C635	B-10F			TP210	B-6F	TP609	B-10A	S204	A-11D	K603	B-12B		
C215	B-9C	C236	B-6F	C257	A-5E	C291	B-9C	C326	A-3C	C355	B-2F	C387	A-6A	C614	A-13E	C636	B-10F	VC601	B-10G	TP300	B-3E	TP610	B-11H	S301	A-7F	K604	B-11B		
C216	B-11C	C237	A-6G	C258	A-6E	C292	B-10C	C327	A-4C	C356	B-1G	C388	A-6A	C615	A-13D	C637	B-11G			TP301	B-4F	TP611	B-11H	S601	A-12D	K605	B-11B		
C217	A-10C	C238	A-6E	C261	B-5G	C303	B-4G	C328	A-4C	C357	A-2G	C389	A-7A	C616	B-12E	C638	B-10F	L381	B-6B	TP302	B-4E			S602	A-13D	K606	A-11A		
C218	A-11C	C239	B-6H	C262	B-5F	C304	B-4F	C330	B-4G	C361	B-3D	C391	A-2G	C617	A-12D	C639	B-9G	L382	B-6B	TP303	B-3C	TB601	B-13A	S603	A-13G	K607	B-10B		
C219	B-9C	C240	B-6F	C263	B-6G	C309	B-4F	C331	A-4G	C362	A-3C	C392	A-2G	C618	B-12E	C640	B-12D	L383	B-7B	TP304	B-3C	TB602	B-12H	S604	A-12C				
C220	B-10C	C241	B-5G	C264	B-5F	C310	B-4E	C332	A-3G	C363	A-3D	C393	A-2F	C619	B-8H	C641	B-11D	L384	A-2G	TP305	B-4D			S605	A-13C	LD601	A-7G		
C223	B-9C	C242	B-5E	C265	A-4G	C313	B-3G	C333	B-3G	C364	B-3C	C601	A-12C	C620	B-10A	C642	B-11F	L601	B-13E	TP306	B-4D	CN201	B-6A	S606	A-11B	LD602	A-10F		

• AUDIO/LCD CIRCUIT BOARD (FOR SERIAL No.××××0732 AND AFTER OF GY-DV500U, ××××0840 AND AFTER OF GY-DV500E)

– SIDE A –



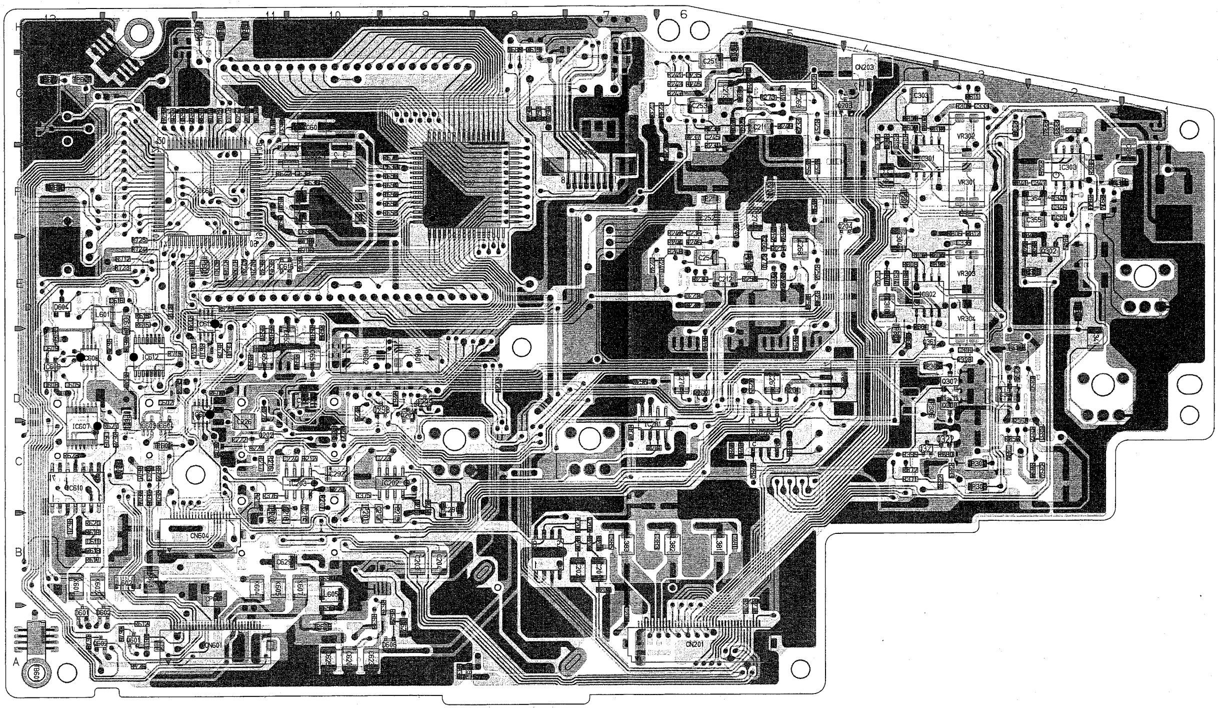
● ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.

A-1C
Side —┘│└—Y axis
└——X axis

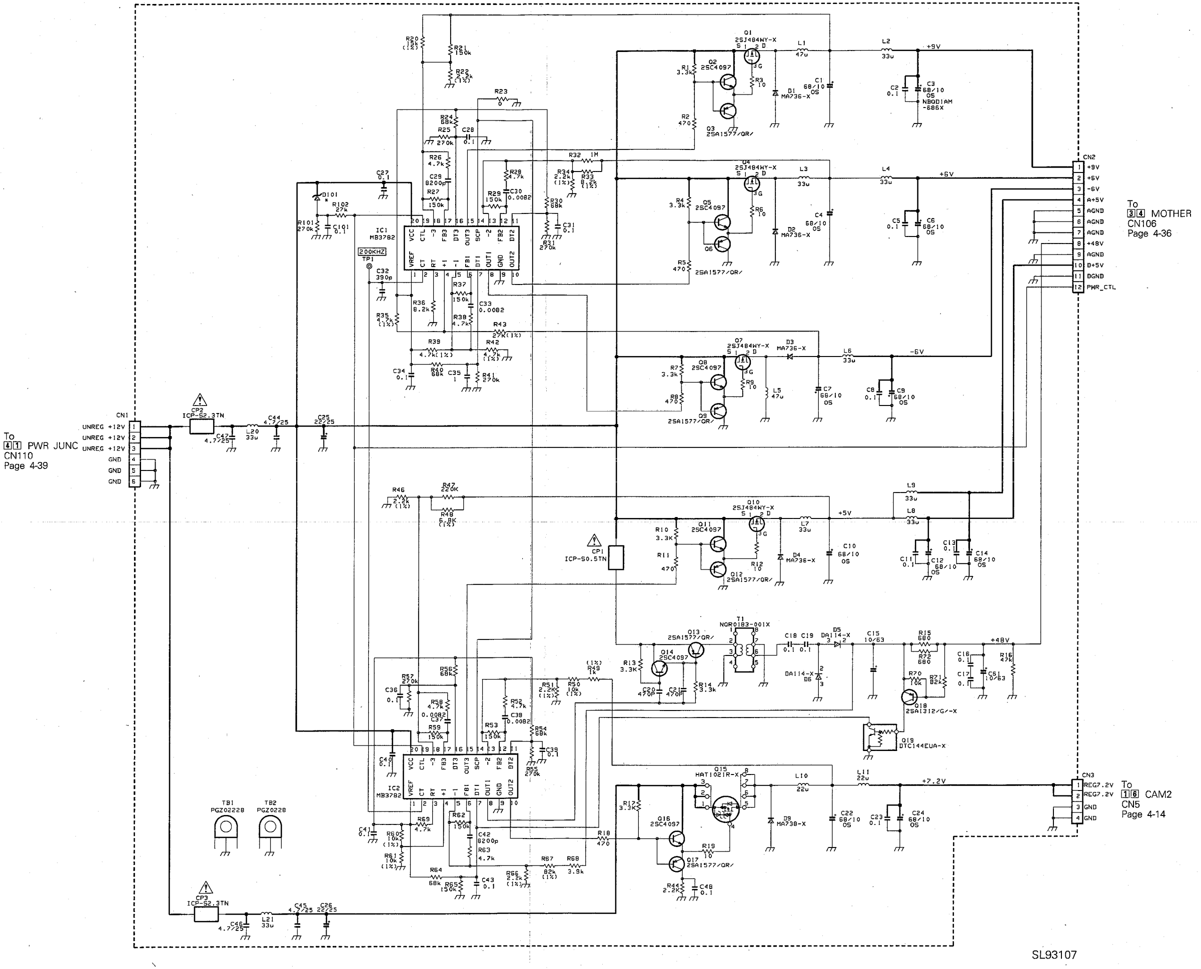
IC201	B-8B	IC601	B-11F	Q204	B-4F	Q607	A-13G	R210	B-11C	R233	B-5G	R254	B-5F	R274	B-5F	R313	B-4G	R334	B-2G	R354	B-2C	R383	B-3C	R607	B-11D	R627	B-12D	R647	A-12E	R666	A-12G	R685	B-8H	R716	A-12F
IC202	B-9C	IC602	B-9F	Q298	B-9D			R211	B-9C	R235	B-6G	R255	B-5G	R281	B-7C	R314	B-4E	R335	B-9A	R355	A-3D	R384	A-2F	R608	A-11D	R628	B-12C	R648	A-12E	R667	A-12G	R686	B-10E	R717	A-12F
IC203	B-10C	IC603	B-12D	Q299	B-9D	D601	B-13B	R212	B-10C	R236	B-6E	R256	B-5E	R282	B-5C	R315	B-4G	R336	B-3G	R356	B-3C	R385	B-2G	R609	A-11H	R630	A-10D	R649	B-12G	R668	A-12F	R687	B-11E	R718	B-10F
IC204	A-6G	IC604	B-12D	Q301	A-2F	D602	B-13B	R215	A-9C	R237	B-6G	R257	B-5G	R283	B-6C	R316	B-4E	R337	A-3G	R358	B-3D	R386	B-2G	R610	A-11H	R631	A-10E	R650	B-12G	R669	A-12F	R688	B-10D	R719	B-12D
IC205	A-6F	IC605	B-11D	Q302	B-2F	D603	A-13E	R216	B-11C	R239	B-6G	R258	B-5E	R284	B-5C	R317	A-3C	R339	B-2F	R359	B-3D	R390	B-9A	R611	B-12A	R632	B-11E	R651	B-12G	R670	A-12F	R689	B-11D	R720	B-12D
IC206	A-5G	IC607	B-13D	Q307	B-3D	D604	B-13E	R217	B-11C	R240	B-6E	R259	B-5E	R298	A-9D	R318	A-3C	R340	B-2F	R361	B-4E	R391	A-6A	R612	B-12A	R633	B-10E	R652	B-12G	R671	B-11D	R701	B-11G	R721	B-11E
IC207	A-5F	IC608	B-13D	Q308	B-3D	D605	A-10A	R218	B-10D	R241	B-6H	R260	B-6E	R299	A-9D	R319	A-3C	R341	B-3F	R362	B-4E	R392	A-6A	R613	A-13D	R634	B-11E	R653	B-11G	R672	B-11D	R702	B-11G	R722	B-11E
IC208	A-5D	IC609	B-13D	Q309	A-4C	D606	B-9A	R219	A-9C	R242	B-6F	R261	B-5D	R301	B-4G	R320	A-3C	R342	B-2F	R369	A-3D	R393	A-6A	R614	A-13D	R635	B-11E	R654	B-9F	R673	A-7G	R703	B-11G	R723	B-12E
IC209	A-6D	IC610	B-13C	Q310	A-1G	D607	A-11E	R220	A-10C	R243	B-6G	R262	B-6D	R302	B-4F	R323	B-2F	R343	B-3F	R370	A-3D	R394	A-6A	R615	B-12E	R636	B-10E	R655	B-9F	R674	A-7H	R704	B-11G	R724	B-12F
IC210	A-11D	IC611	A-12E	Q311	A-1F			R221	A-9D	R244	B-6F	R263	B-9D	R303	B-4G	R324	B-2F	R344	B-2F	R371	B-4C	R395	B-4C	R616	B-12E	R637	A-9B	R656	B-9F	R675	B-12A	R705	B-11G	R725	B-12F
IC211	A-9D	IC612	B-12D	Q321	B-4C	R201	B-6B	R222	B-11C	R245	B-6G	R264	A-11D	R304	B-3F	R325	A-2E	R345	B-2F	R372	B-4C	R396	A-1G	R617	B-13B	R638	B-10A	R657	B-9F	R676	A-11D	R706	B-10F	R726	B-12A
IC281	B-7D	IC615	A-10E	Q322	B-3C	R202	B-7B	R223	A-9D	R246	B-6F	R265	B-6G	R305	B-3G	R326	A-2F	R346	B-2F	R373	A-3D	R397	A-4G	R618	B-13B	R639	B-9B	R658	B-9F	R677	B-9G	R707	B-11E	R727	B-11E
IC282	B-5D	IC616	B-11E	Q361	B-4E	R203	B-7B	R224	B-11C	R247	B-6G	R266	B-5F	R306	B-3F	R327	A-2F	R347	A-2D	R374	A-3D	R398	A-4E	R619	B-13B	R640	B-9A	R659	A-12G	R678	A-12F	R708	B-11E	R728	B-12E
IC298	A-10D	IC618	A-10B	Q601	B-12A	R204	B-7B	R225	B-10D	R248	B-6F	R267	B-6G	R307	B-4G	R328	B-3D	R348	A-3D	R375	B-10C	R601	B-12C	R620	B-13C	R641	B-11F	R660	A-12G	R679	B-13A	R709	B-12E	R729	B-8D
IC299	A-9D	IC619	B-11E	Q602	B-13A	R205	B-7B	R226	B-11D	R249	B-5G	R268	B-5E	R308	B-4E	R329	A-3G	R349	A-3D	R376	B-11C	R602	B-12C	R621	B-13C	R642	B-11F	R661	A-12G	R680	A-8H	R710	B-11E		
IC301	B-4G			Q603	A-7H	R206	B-7C	R227	B-10D	R250	B-6E	R269	B-6G	R309	B-4G	R330	A-2F	R350	B-2D	R377	B-7D	R603	B-12C	R622	A-13C	R643	B-8G	R662	A-12G	R681	A-8H	R711	B-12E	VR201	A-7C
IC302	B-4E	Q201	B-9D	Q604	A-7H	R207	B-10C	R228	A-11C	R251	B-5G	R270	B-5E	R310	B-4E	R331	A-2F	R351	B-2C	R380	B-3C	R604	B-12C	R623	B-13C	R644	B-8G	R663	A-12G	R682	A-8H	R712	B-12F	VR202	A-9C
IC303	B-2G	Q202	B-11D	Q605	A-11E	R208	A-10B	R230	B-6E	R252	B-5E	R271	B-5B	R311	B-3G	R332	A-2F	R352	B-2C	R381	A-7A	R605	B-12C	R625	B-12E	R645	B-8G	R664	A-12G	R683	A-8H	R714	B-11G	VR301	B-3F
IC304	A-3D	Q203	B-4G	Q606	A-12H	R209	A-10B	R231	B-6G	R253	B-5H	R273	B-5G	R312	B-3F	R333	B-2G	R353	B-2C	R382	B-3C	R606	B-12C	R626	A-12D	R646	A-12E	R665	A-12G	R684	A-8H	R715	A-12F	VR302	B-3G

– SIDE B –

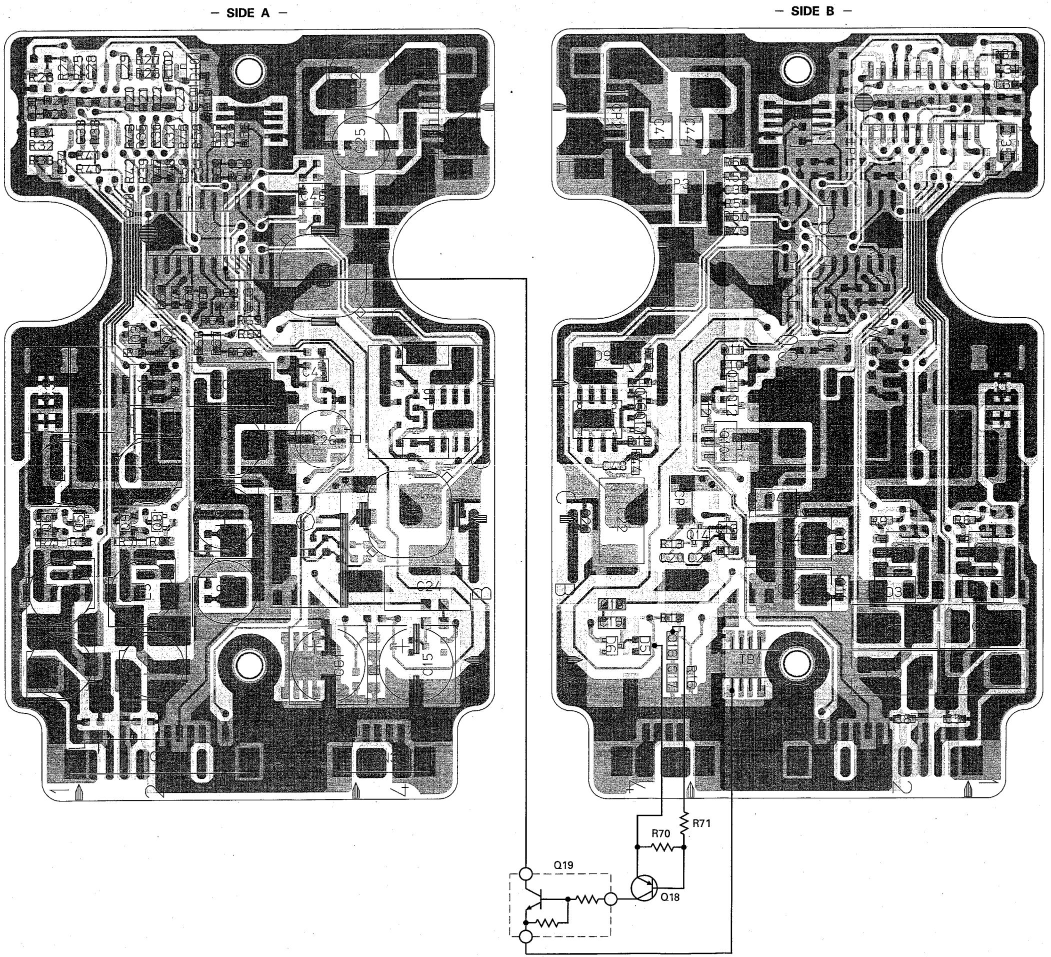


VR303	B-3E	C214	B-10C	C235	B-6H	C255	B-5D	C281	A-6C	C324	A-4G	C353	A-2G	C385	B-7B	C612	A-13C	C634	A-13B	C671	A-4D	TP210	B-6F	TP609	B-10A	S204	A-11D	K602	B-13B
VR304	B-3E	C215	B-9C	C236	B-6F	C256	B-7D	C282	B-6C	C325	A-3C	C354	B-2F	C386	A-7B	C613	A-13C	C635	B-10F			TP300	B-3D	TP610	B-11H	S301	A-7F	K603	B-12B
VR310	A-2D	C216	B-11C	C237	A-6H	C257	A-5E	C291	B-9C	C326	A-3C	C355	B-2F	C387	A-6A	C614	A-13E	C636	B-10F	VC601	B-10G	TP301	B-4F	TP611	B-11H	S601	A-12D	K604	B-11B
VR311	A-1E	C217	A-10C	C238	A-6E	C258	A-6E	C292	B-10C	C327	A-4C	C356	B-1G	C388	A-6A	C615	A-13D	C637	B-11G			TP302	B-4E			S602	A-13D	K605	B-11B
VR601	B-9D	C218	A-11C	C239	B-6H	C261	B-5G	C303	B-4G	C328	A-4C	C357	A-2G	C389	A-7A	C616	B-12E	C638	B-10F	L381	B-6B	TP303	B-3C	TB601	B-13A	S603	A-13G	K606	A-11A
VR602	B-10D	C219	B-9C	C240	B-6F	C262	B-5F	C304	B-4F	C330	B-4G	C361	B-3D	C391	A-2G	C617	A-12D	C639	B-9G	L382	B-6B	TP304	B-3C	TB602	B-12H	S604	A-12C	K607	B-10B
		C220	B-10C	C241	B-6G	C263	B-6G	C309	B-4F	C331	A-4G	C362	A-3C	C392	A-2G	C618	B-12E	C640	B-12D	L383	B-7B	TP305	B-4D			S605	A-13C		
C201	B-7B	C223	B-9C	C242	B-5E	C264	B-5F	C310	B-4E	C332	A-3G	C363	A-3D	C393	A-2F	C619	B-8H	C641	B-11D	L384	A-2G	TP306	B-4D	CN201	B-6A	S606	A-11B	LD601	A-7G
C202	B-7B	C224	B-10C	C243	A-5G	C265	A-4G	C313	B-3G	C333	B-3G	C364	B-3C	C601	A-12C	C620	B-10A	C642	B-11F	L601	B-13E	TP311	B-2F	CN202	B-5D	S607	A-11B	LD602	A-10F
C203	B-9B	C225	B-10D	C244	A-5E	C266	A-5F	C314	B-3E	C334	B-4E	C366	A-3D	C602	B-12D	C621	A-10B	C643	B-11G	L602	B-12B	TP312	B-2E	CN203	B-4H	S608	A-12B		
C204	B-9B	C226	B-11D	C245	B-6G	C267	B-5D	C315	B-3F	C335	A-4E	C368	A-2C	C603	B-12D	C622	A-10A	C645	A-12D	L603	A-11B	TP313	B-2E	CN601	B-11A	S609	A-13B	BT601	A-7A
C205	B-7C	C227	B-6E	C247	A-6G	C268	B-5F	C316	B-3D	C336	B-3F	C370	A-3D	C604	B-11C	C623	B-10A	C651	B-10D	L604	A-11B	TP601	B-12C	CN602	B-7G	S610	A-7G		
C206	B-7A	C228	B-6G	C248	A-5E	C269	B-5G	C317	A-4E	C337	A-3F	C372	A-2C	C605	B-13D	C624	B-9A	C652	B-11D	L605	B-10B	TP602	B-12C	CN604	B-11B	S611	A-13F	DI601	A-10F
C207	A-7B	C229	A-6F	C249	A-4G	C270	B-6D	C318	A-3F	C341	B-2E	C373	A-3D	C606	B-12C	C625	B-10A	C653	B-11E			TP603	B-12D			S612	A-9B		
C208	A-7C	C230	A-6E	C250	A-5E	C271	A-5H	C319	A-3E	C342	A-2E	C374	A-3D	C607	B-13E	C628	A-12B	C654	B-10B	TP200	B-5F	TP604	B-11H	CP601	B-11B			PC201	A-5C
C209	A-6C	C231	A-7G	C251	B-6H	C272	A-5F	C320	A-4F	C343	A-2F	C381	B-6B	C608	B-13D	C629	B-11B	C655	B-10B	TP201	B-10C	TP605	B-11E			X601	B-10F		
C211	B-5G	C232	A-7E	C252	B-6F	C273	B-6G	C321	A-3E	C346	B-2F	C382	A-6B	C609	B-13E	C630	A-10B	C656	A-10A	TP202	B-11C	TP606	B-13H	S201	A-10C	X602	B-10G		
C212	B-6E	C233	B-7G	C253	B-6G	C274	B-5F	C322	A-3G	C347	B-2F	C383	B-7B	C610	B-12E	C631	A-13B	C657	A-13C	TP206	B-6F	TP607	B-13H	S202	A-11C				
C213	B-10C	C234	B-7E	C254	B-6F	C280	A-7D	C323	A-4E	C349	A-2F	C384	A-6B	C611	B-13B	C633	A-12A	C670	A-4D	TP209	B-6H	TP608	B-13F	S203	A-10D	K601	B-13B		

4.22 REG(REGulater) SCHEMATIC DIAGRAM 3 3


To
4 1 PWR JUNC
CN110
Page 4-39
CN1
UNREG +12V
UNREG +12V
UNREG +12V
GND
GND
GND
CP2 ICP-S2.3TN
C47 4.7/25
L20 33u
C44 4.7/25
C25 22/25
IC1 MB3782
VCC CTL -3 FB3 DT3 OUT3 SCP -2 FB2 DT2
VREF CT RT +1 -1 FB1 DT1 OUT1 GND OUT2
200KHZ
TP1
C32 390p
D101 *
R102 27k
R101 270k
C101 0.1
C27 0.1
R20 15k (1%)
R21 150k
R22 2.2k (1%)
R23 0
R24 68k
R25 270k
C28 0.1
R26 4.7k
C29 8200p
R27 150k
R28 4.7k
C30 0.0082
R29 150k
R30 68k
R31 270k
C31 0.1
R32 1M
R33 8.2k (1%)
R34 2.2k (1%)
R35 4.7k (1%)
R36 8.2k
R37 150k
C33 0.0082
R38 4.7k
R39 4.7k(1%)
R40 68k
R41 270k
R42 4.7k (1%)
R43 27K(1%)
C34 0.1
C35 1
Q1 2SJ484WY-X
S 1 2 D 3G
Q2 2SC4097
Q3 2SA1577/QR/
R1 3.3k
R2 470
R3 10
D1 MA736-X
L1 47u
C1 68/10 OS
L2 33u
+9V
C2 0.1
C3 68/10 OS NBQD1AM -686X
Q4 2SJ484WY-X
Q5 2SC4097
Q6
2SA1577/QR/
R4 3.3k
R5 470
R6 10
D2 MA736-X
L3 33u
C4 68/10 OS
L4 33u
+6V
C5 0.1
C6 68/10 OS
Q7 2SJ484WY-X
Q8 2SC4097
Q9 2SA1577/QR/
R7 3.3k
R8 470
R9 10
D3 MA736-X
L5 47u
C7 68/10 OS
L6 33u
-6V
C8 0.1
C9 68/10 OS
CN2
+9V
+6V
-6V
A+5V
AGND
AGND
AGND
+48V
AGND
D+5V
DGND
PWR_CTL
To
3 4 MOTHER
CN106
Page 4-36
R46 2.2k (1%)
R47 220K
R48 6.8K (1%)
CP1 ICP-S0.5TN
Q10 2SJ484WY-X
Q11 2SC4097
Q12 2SA1577/QR/
R10 3.3K
R11 470
R12 10
D4 MA736-X
L7 33u
+5V
C10 68/10 OS
L9 33u
L8 33u
C11 0.1
C12 68/10 OS
C13 0.1
C14 68/10 OS
T1 NQR0183-001X
Q13 2SA1577/QR/
Q14 2SC4097
R13 3.3K
R14 3.3k
C20 470P
C21 470P
C18 0.1
C19 0.1
D5 DA114-X
D6 DA114-X
C15 10/63
R15 680
R72 680
+48V
R70 10k
R71 82k
Q18 2SA1312/G/-X
Q19 DTC144EUA-X
C16 0.1
C17 0.1
C61 10/63
R16 47k
IC2 MB3782
C40 0.1
C36 0.1
R57 270k
R56 68k
R58 4.7k
C37 0.0082
R59 150k
R53 150k
R52 4.7k
C38 0.0082
R54 68k
R55 270k
C39 0.1
R51 2.2K (1%)
R50 10k (1%)
R49 1k (1%)
C41 0.1
R60 10k (1%)
R61 10k (1%)
R69 4.7k
R62 150k
C42 8200p
R63 4.7k
R64 68k
R65 150k
C43 0.1
R66 2.2k (1%)
R67 82k (1%)
R68 3.9k
R18 470
Q15 HAT1021R-X
R17 3.3K
Q16 2SC4097
Q17 2SA1577/QR/
R19 10
R44 2.2K
C48 0.1
D9 MA738-X
L10 22u
L11 22u
+7.2V
C22 68/10 OS
C23 0.1
C24 68/10 OS
CN3
REG7.2V
REG7.2V
GND
GND
To
1 6 CAM2
CN5
Page 4-14
TB1 PGZ0222B
TB2 PGZ0222B
CP3 ICP-S2.3TN
C46 4.7/25
L21 33u
C45 4.7/25
C26 22/25
SL93107

4.23 REG CIRCUIT BOARD



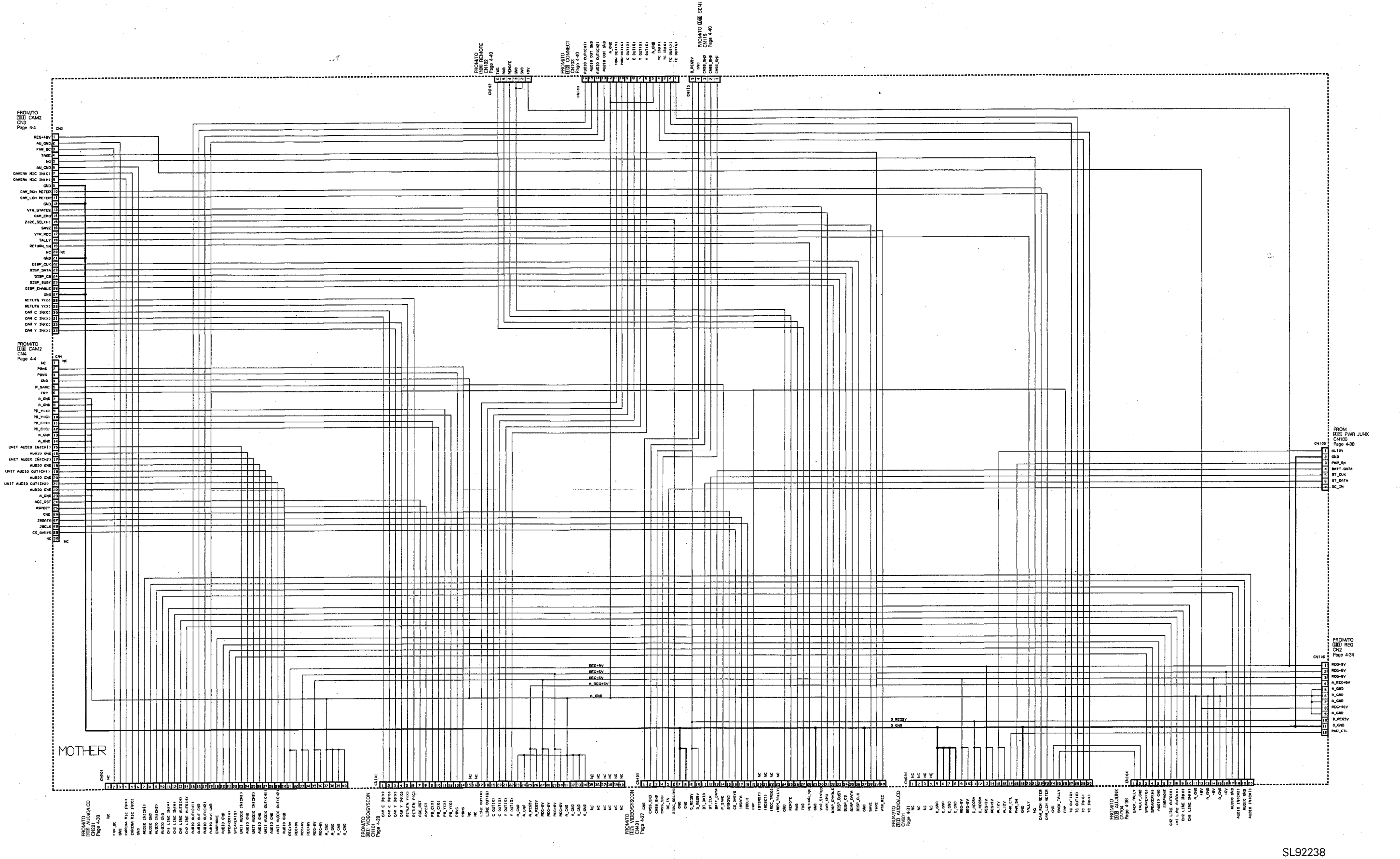
● **ADDRESS TABLE OF BOARD PARTS**

Each address may have an address error by one interval.

A-1C
Side — Y axis
X axis

IC1	B-1F
IC2	A-2E
Q1	A-1D
Q2	A-2D
Q3	A-1D
Q4	B-1B
Q5	A-1C
Q6	A-1C
Q7	B-2B
Q8	A-2C
Q9	A-1C
Q10	B-3C
Q11	B-3D
Q12	B-3D
Q13	B-3C
Q14	B-3C
Q15	B-4D
Q16	B-4D
Q17	B-4C
D1	A-2D
D2	B-1B
D3	B-2B
D4	B-3C
D5	B-4B
D6	B-4B
D9	B-4D
D101	A-2F
R1	A-2D
R2	A-1D
R3	A-2D
R4	A-1C
R5	A-1C
R6	B-1C
R7	A-1C
R8	A-2C
R9	B-2C
R10	B-3D
R11	B-3D
R12	B-3D
R13	B-3C
R14	B-3B
R15	B-3B
R16	B-3A
R17	B-4D
R18	B-4D
R19	B-4C
R20	A-1F
R21	A-1F
R22	A-2F
R23	A-1F
R24	A-1F
R25	A-1F
R26	A-2F
R27	A-2F
R28	A-1F
R29	A-1F
R30	B-1F
R31	B-1F
R32	A-1F
R33	A-1F
R34	A-1F
R35	A-1F
R36	A-2F
R37	A-1F
R38	A-1F
R39	A-1F
R40	A-1F
R41	A-1F
R42	A-1F
R43	A-1F
R44	B-4C
R46	A-2F
R47	A-2F
R48	A-2F
R49	B-3E
R50	B-3E
R51	B-3E
R52	A-2F
R53	A-2E
R54	B-3F
R55	B-3E
R56	A-2F
R57	A-2F
R58	A-2F
R59	A-2F
R60	A-2E
R61	A-2E
R62	A-2E
R63	A-2D
R64	A-2D
R65	A-2D
R66	A-2D
R67	A-2D
R68	A-2D
R69	A-2E
R101	A-2F
R102	A-2F
C1	A-1D
C2	B-1D
C3	A-1D
C4	B-1B
C5	B-1A
C6	B-1A
C7	B-2B
C8	B-1A
C9	B-2A
C10	A-2D
C11	B-2B
C12	B-3B
C13	B-2C
C14	B-3C
C15	A-4B
C16	B-3B
C17	B-3A
C18	B-4B
C19	B-4B
C20	B-3B
C21	B-3B
C22	B-4C
C23	B-4C
C24	A-4B
C25	A-3F
C26	A-3C
C27	A-2F
C28	A-1F
C29	A-1F
C30	A-1F
C31	B-1F
C32	A-2F
C33	A-1F
C34	A-1F
C35	B-1F
C36	A-2F
C37	A-2F
C38	A-2F
C39	B-3E
C40	A-1E
C41	A-2E
C42	A-2D
C43	A-2E
C44	B-3F
C45	A-3D
C46	A-3E
C47	B-4F
C48	B-4C
C61	A-3B
C101	A-2F
L1	A-2C
L2	A-1C
L3	A-1B
L4	A-1B
L5	A-1B
L6	A-2B
L7	A-2C
L8	A-2B
L9	A-2C
L10	A-4D
L11	A-4C
L20	A-3F
L21	A-3E
TP1	B-2F
T1	A-3B
CP1	B-3C
CP2	B-4F
CP3	B-3E
CN1	A-4F
CN2	A-2A
CN3	A-4A
TB1	B-2B
TB2	B-2F

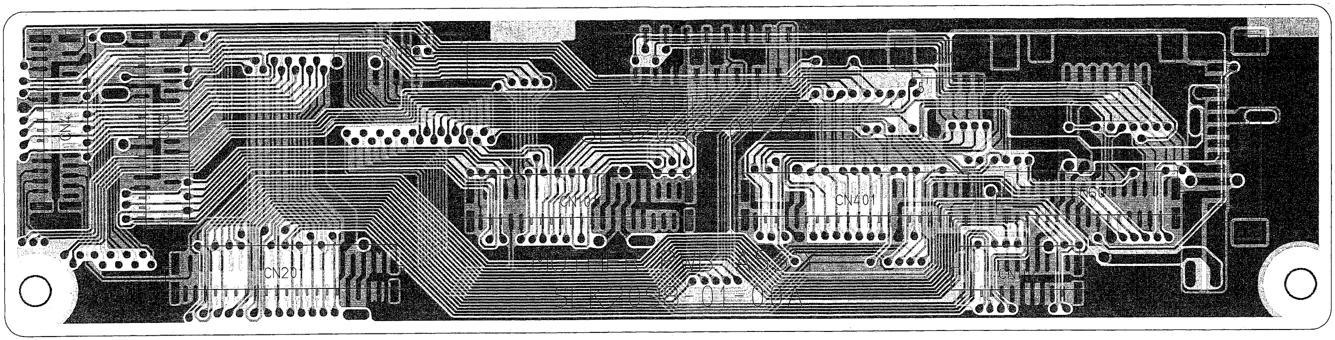
4.24 MOTHER SCHEMATIC DIAGRAM 3 4


MOTHER
FROM/TO 1 6 CAM2 CN3 Page 4-4
CN3
1 REG+48V
2 AU_GND
3 FVR_DC
4 TAKE
5 NG
6 AU_GND
7 CAMERA MIC IN(C)
8 CAMERA MIC IN(H)
9 GND
10 CAM_RCH METER
11 CAM_LCH METER
12 GND
13 VTR_STATUS
14 CAM_CMD
15 232C_SEL(H)
16 SAVE
17 VTR_REC
18 TALLY
19 RETURN_SN
20 NC
21 GND
22 DISP_CLK
23 DISP_DATA
24 DISP_CS
25 DISP_BUSY
26 DISP_ENABLE
27 GND
28 RETUTN Y(G)
29 RETUTN Y(X)
30 CAM C IN(G)
31 CAM C IN(X)
32 CAM Y IN(G)
33 CAM Y IN(X)
FROM/TO 1 6 CAM2 CN4 Page 4-4
CN4
1 NC
2 PBHS
3 PBVS
4 GND
5 P_SAVE
6 FRP
7 A_GND
8 A_GND
9 PB_Y(X)
10 PB_Y(G)
11 PB_C(X)
12 PB_C(G)
13 A_GND
14 A_GND
15 UNIT AUDIO IN(CH1)
16 AUDIO GND
17 UNIT AUDIO IN(CH2)
18 AUDIO GND
19 UNIT AUDIO OUT(CH1)
20 AUDIO GND
21 UNIT AUDIO OUT(CH2)
22 AUDIO GND
23 A_GND
24 AGC_RST
25 ASPECT
26 GND
27 JBDATA
28 JBCLK
29 CS_DVSYS
30 NC
FROM/TO 3 5 REMOTE CN102 Page 4-40
CN102
6 TXD
5 RXD
4 REMOTE
3 GND
2 GND
1 +5V
FROM/TO 4 2 CONNECT CN103 Page 4-40
CN103
16 AUDIO OUT(CH1)
15 AUDIO OUT GND
14 AUDIO OUT(CH2)
13 AUDIO OUT GND
12 A_GND
11 MON OUT(X)
10 MON OUT(G)
9 C OUT(X)
8 C OUT(G)
7 Y OUT(X)
6 Y OUT(G)
5 A_GND
4 TC IN(X)
3 TC IN(G)
2 TC OUT(X)
1 TC OUT(G)
FROM/TO 3 6 SEN1 CN115 Page 4-40
CN115
5 D_REG5V
4 GND
3 CASS_SW3
2 CASS_SW2
1 CASS_SW1
FROM 4 3 PWR JUNK CN105 Page 4-38
CN105
1 AL12V
2 GND
3 PWR_SW
4 BATT_DATA
5 BT_CLK
6 BT_DATA
7 DC_IN
FROM/TO 3 3 REG CN2 Page 4-34
CN106
1 REG+9V
2 REG+6V
3 REG-6V
4 A_REG+5V
5 A_GND
6 A_GND
7 A_GND
8 REG+48V
9 A_GND
10 D_REG5V
11 D_GND
12 PWR_CTL
REG+9V
REG+6V
REG-6V
A_REG+5V
A_GND
D_REG5V
D_GND
FROM/TO 3 2 AUDIO/LCD CN201 Page 4-30
CN201
1 NC
2 FVR_DC
3 GND
4 CAMERA MIC IN(H)
5 CAMERA MIC IN(C)
6 GND
7 AUDIO IN(CH1)
8 AUDIO GND
9 AUDIO IN(CH2)
10 AUDIO GND
11 CH1 LINE IN(H)
12 CH2 LINE IN(H)
13 CH1 LINE AUTO(H)
14 CH2 LINE AUTO(H)
15 AUDIO OUT(CH1)
16 AUDIO OUT GND
17 AUDIO OUT(CH2)
18 AUDIO OUT GND
19 EARPHONE
20 AUDIO GND
21 SPEAKER(H)
22 SPEAKER(G)
23 UNIT AUDIO IN(CH1)
24 AUDIO GND
25 UNIT AUDIO IN(CH2)
26 AUDIO GND
27 UNIT AUDIO OUT(CH1)
28 AUDIO GND
29 UNIT AUDIO OUT(CH2)
30 AUDIO GND
31 REG+9V
32 REG+9V
33 REG+6V
34 REG+6V
35 REG-6V
36 REG-6V
37 A_GND
38 A_GND
39 A_GND
40 A_GND
FROM/TO 3 1 VIDEO/SYSCON CN101 Page 4-28
CN101
1 CAM C IN(X)
2 CAM C IN(G)
3 CAM Y IN(X)
4 CAM Y IN(G)
5 RETUTN Y(X)
6 RETUTN Y(G)
7 AGC_RST
8 ASPECT
9 PB_C(X)
10 PB_C(G)
11 PB_Y(X)
12 PB_Y(G)
13 PBVS
14 PBHS
15 NC
16 NC
17 LINE OUT(X)
18 LINE OUT(G)
19 C OUT(X)
20 C OUT(G)
21 Y OUT(X)
22 Y OUT(G)
23 A_GND
24 A_GND
25 A_REG5V
26 A_REG5V
27 REG-6V
28 REG-6V
29 REG+6V
30 REG+6V
31 A_GND
32 A_GND
33 A_GND
34 A_GND
35 NC
36 NC
37 NC
38 NC
39 NC
40 NC
FROM/TO 3 1 VIDEO/SYSCON CN401 Page 4-27
CN401
1 GND
2 CASS_SW3
3 CASS_SW2
4 CASS_SW1
5 DC_IN
6 232C_SEL(H)
7 GND
8 GND
9 D_REG5V
10 D_REG5V
11 BT_DATA
12 BT_CLK
13 BATT_DATA
14 P_SAVE
15 SYSGND
16 CS_DVSYS
17 JBDATA
18 JBCLK
19 FRP
20 (SYSRST)
21 (RESET)
22 (REC_TRIG)
23 (REM_TALLY)
24 GND
25 REMOTE
26 RXD
27 TXD
28 RETURN_SW
29 GND
30 VTR_STATUS
31 CAM_CMD
32 DISP_ENABLE
33 DISP_BUSY
34 DISP_CS
35 DISP_DATA
36 DISP_CLK
37 GND
38 SAVE
39 TAKE
40 VTR_REC
FROM/TO 3 2 AUDIO/LCD CN601 Page 4-31
CN601
1 NC
2 NC
3 NC
4 NC
5 D_GND
6 D_GND
7 D_GND
8 D_GND
9 REG-6V
10 REG-6V
11 D_REG5V
12 D_REG5V
13 REG+9V
14 REG+9V
15 AL12V
16 AL12V
17 PWR_CTL
18 PWR_SW
19 GND
20 TALLY
21 NG
22 CAM_RCH METER
23 CAM_LCH METER
24 GND
25 BACK_TALLY
26 FRP
27 TC OUT(G)
28 TC OUT(X)
29 TC IN(G)
30 TC IN(X)
FROM/TO 3 9 AU.JUNK CN104 Page 4-38
CN104
1 BACK_TALLY
2 TALLY_GND
3 SPEAKER(G)
4 SPEAKER(H)
5 AUDIO GND
6 EARPHONE
7 CH2 LINE AUTO(H)
8 CH1 LINE AUTO(H)
9 CH2 LINE IN(H)
10 CH1 LINE IN(H)
11 A_GND
12 48V
13 A_GND
14 -6V
15 A_GND
16 +6V
17 AUDIO GND
18 AUDIO IN(CH2)
19 AUDIO GND
20 AUDIO IN(CH1)
SL92238

4.25 MOTHER, AU JUNK CIRCUIT BOARD

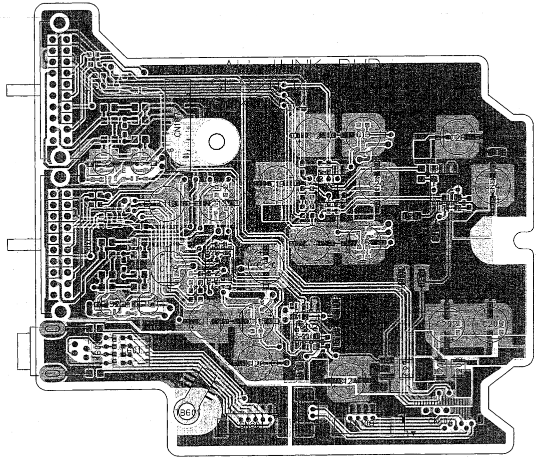
· MOTHER

– SIDE A –

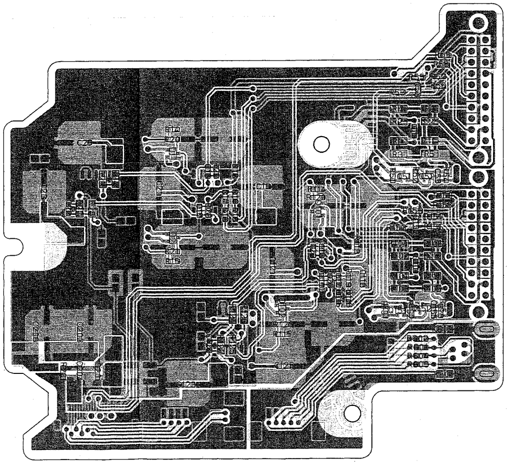

CN4
CN101
CN401
CN201

· AU JUNK

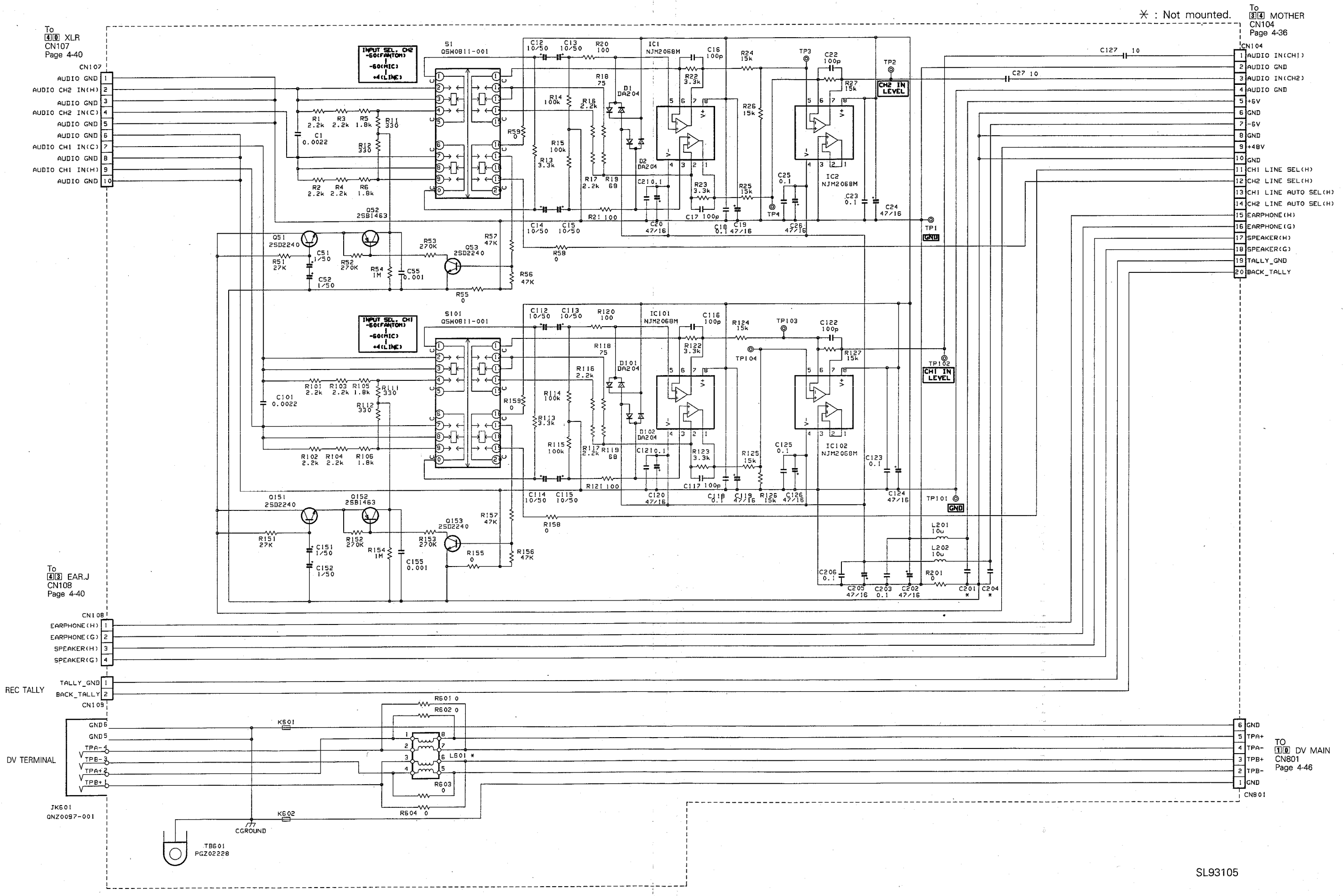
– SIDE A –


C202
C203
TB601

– SIDE B –

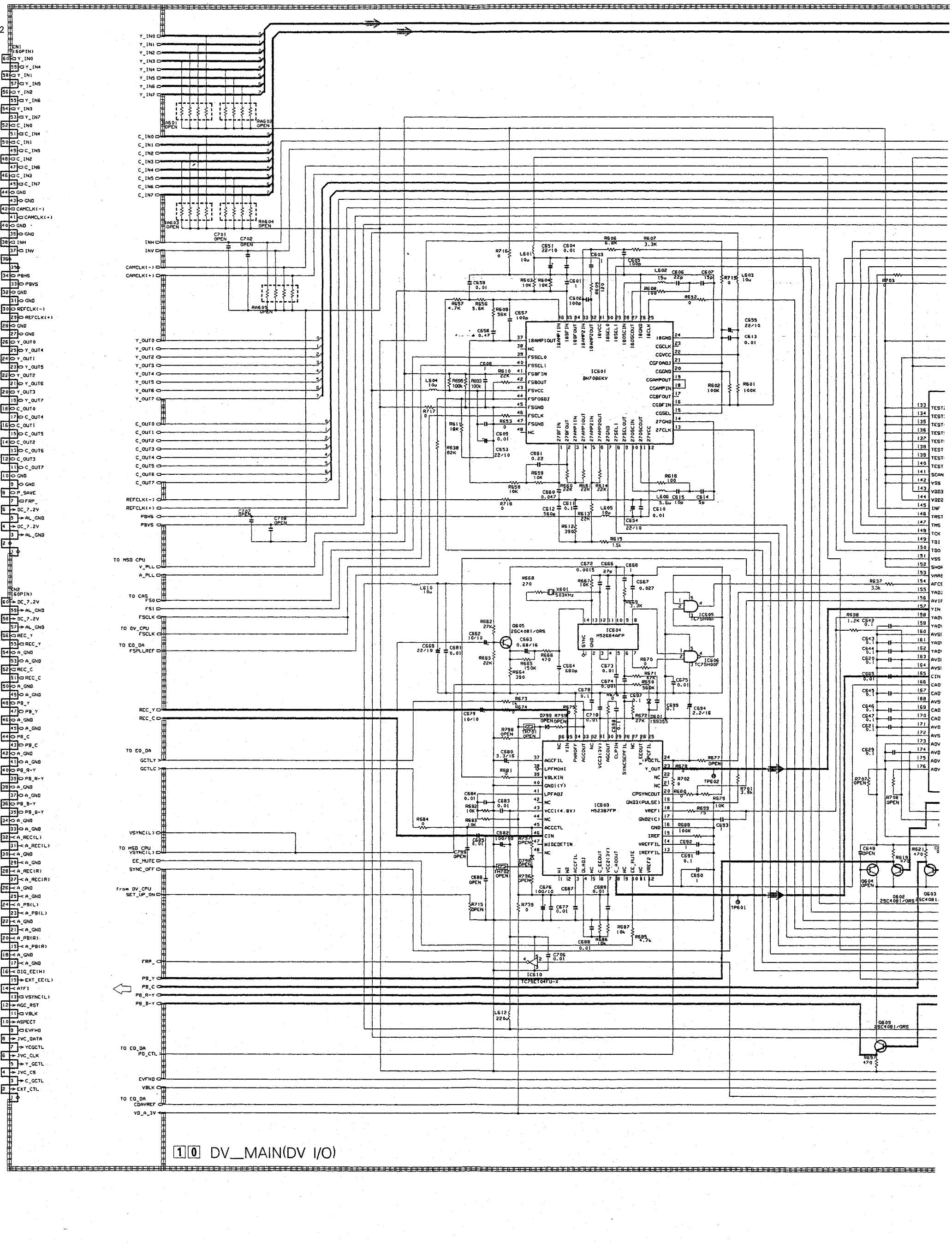


4.26 AU JUNK SCHEMATIC DIAGRAM 39

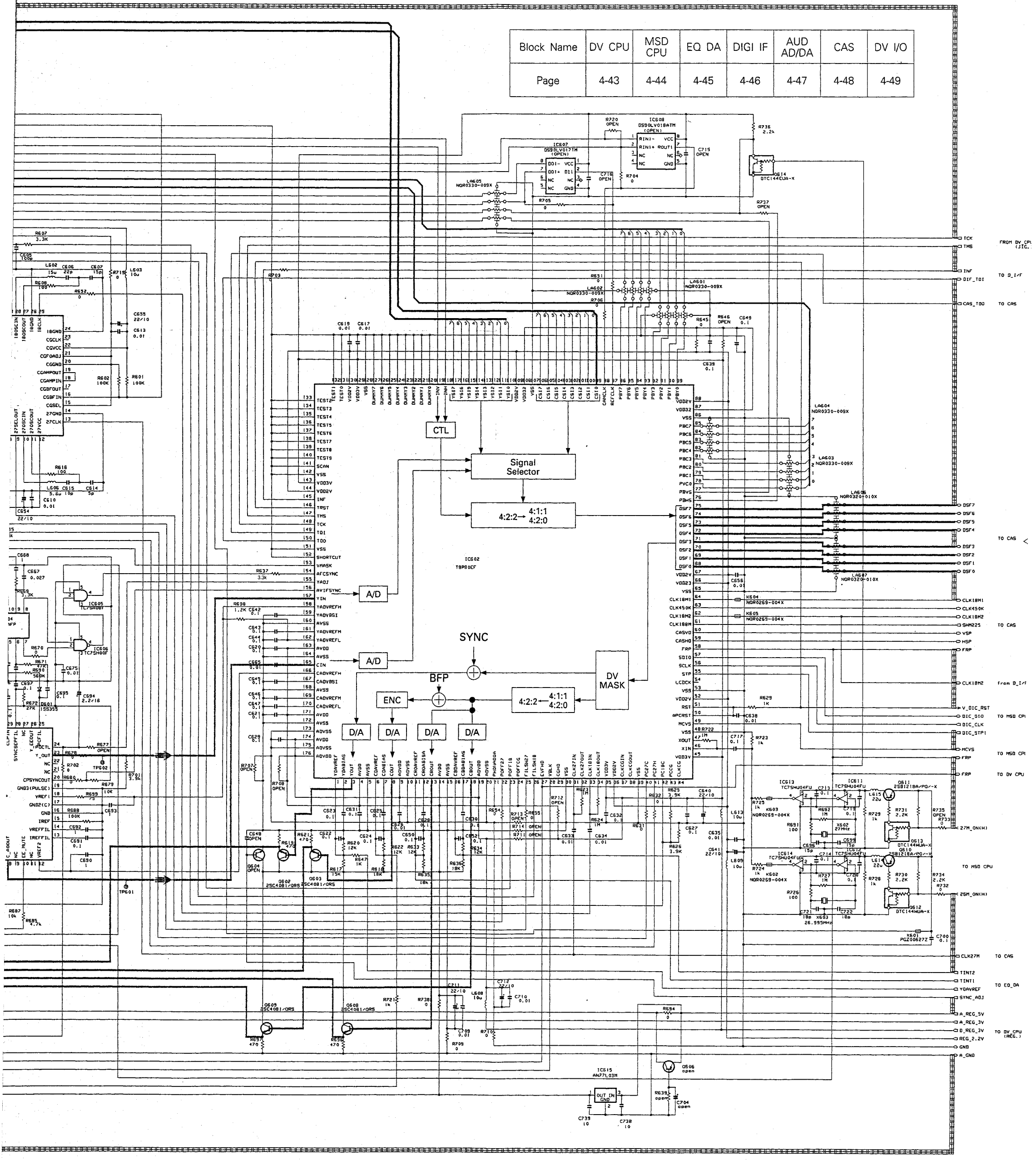

✳ : Not mounted.
To 40 XLR CN107 Page 4-40
CN107
AUDIO GND 1
AUDIO CH2 IN(H) 2
AUDIO GND 3
AUDIO CH2 IN(C) 4
AUDIO GND 5
AUDIO GND 6
AUDIO CH1 IN(C) 7
AUDIO GND 8
AUDIO CH1 IN(H) 9
AUDIO GND 10
To 34 MOTHER CN104 Page 4-36
CN104
1 AUDIO IN(CH1)
2 AUDIO GND
3 AUDIO IN(CH2)
4 AUDIO GND
5 +6V
6 GND
7 -6V
8 GND
9 +48V
10 GND
11 CH1 LINE SEL(H)
12 CH2 LINE SEL(H)
13 CH1 LINE AUTO SEL(H)
14 CH2 LINE AUTO SEL(H)
15 EARPHONE(H)
16 EARPHONE(G)
17 SPEAKER(H)
18 SPEAKER(G)
19 TALLY_GND
20 BACK_TALLY
INPUT SEL. CH2 -60(FANTOM) -60(MIC) +4(LINE)
S1 QSW0811-001
INPUT SEL. CH1 -60(FANTOM) -60(MIC) +4(LINE)
S101 QSW0811-001
IC1 NJM2068M
IC2 NJM2068M
IC101 NJM2068M
IC102 NJM2068M
CH2 IN LEVEL
CH1 IN LEVEL
TP1 GND
TP2
TP3
TP4
TP101 GND
TP102
TP103
TP104
C12 10/50
C13 10/50
R20 100
C16 100p
R24 15k
C22 100p
R22 3.3k
R27 15k
R18 75
D1 DA204
R14 100k
R16 2.2k
R26 15k
R59 0
R15 100k
R13 3.3k
D2 DA204
R17 2.2k
R19 68
C210.1
R23 3.3k
R25 15k
C25 0.1
C23 0.1
C24 47/16
C14 10/50
C15 10/50
R21 100
C20 47/16
C17 100p
C18 0.1
C19 47/16
C26 47/16
C127 10
C27 10
R1 2.2k
R3 2.2k
R5 1.8k
R11 330
C1 0.0022
R12 330
R2 2.2k
R4 2.2k
R6 1.8k
Q52 2SB1463
Q51 2SD2240
R51 27K
C51 1/50
R52 270K
C52 1/50
R54 1M
C55 0.001
R53 270K
Q53 2SD2240
R57 47K
R56 47K
R55 0
R58 0
C112 10/50
C113 10/50
R120 100
C116 100p
R124 15k
C122 100p
R122 3.3k
R127 15k
R118 75
D101 DA204
R116 2.2k
R114 100k
R113 3.3k
R159 0
R115 100k
D102 DA204
R117 2.2k
R119 68
C1210.1
R123 3.3k
R125 15k
C125 0.1
C123 0.1
C124 47/16
C114 10/50
C115 10/50
R121 100
C120 47/16
C117 100p
C118 0.1
C119 47/16
R126 15k
C126 47/16
R101 2.2k
R103 2.2k
R105 1.8k
R111 330
C101 0.0022
R112 330
R102 2.2k
R104 2.2k
R106 1.8k
Q151 2SD2240
Q152 2SB1463
R151 27K
C151 1/50
C152 1/50
R152 270K
R154 1M
C155 0.001
R153 270K
Q153 2SD2240
R155 0
R157 47K
R156 47K
R158 0
L201 10u
L202 10u
R201 0
C206 0.1
C205 47/16
C203 0.1
C202 47/16
C201 ✳
C204 ✳
To 43 EAR.J CN108 Page 4-40
CN108
EARPHONE(H) 1
EARPHONE(G) 2
SPEAKER(H) 3
SPEAKER(G) 4
REC TALLY
TALLY_GND 1
BACK_TALLY 2
CN109
DV TERMINAL
GND 6
GND 5
TPA- 4
TPB- 3
TPA+ 2
TPB+ 1
JK601 QNZ0097-001
K601
K602
R601 0
R602 0
L601 ✳
R603 0
R604 0
CGROUND
TB601 PGZ02228
6 GND
5 TPA+
4 TPA-
3 TPB+
2 TPB-
1 GND
CN801
TO 10 DV MAIN CN801 Page 4-46
SL93105

• DV MAIN SCHEMATIC DIAGRAM (7/7) 10

– DV I/O –

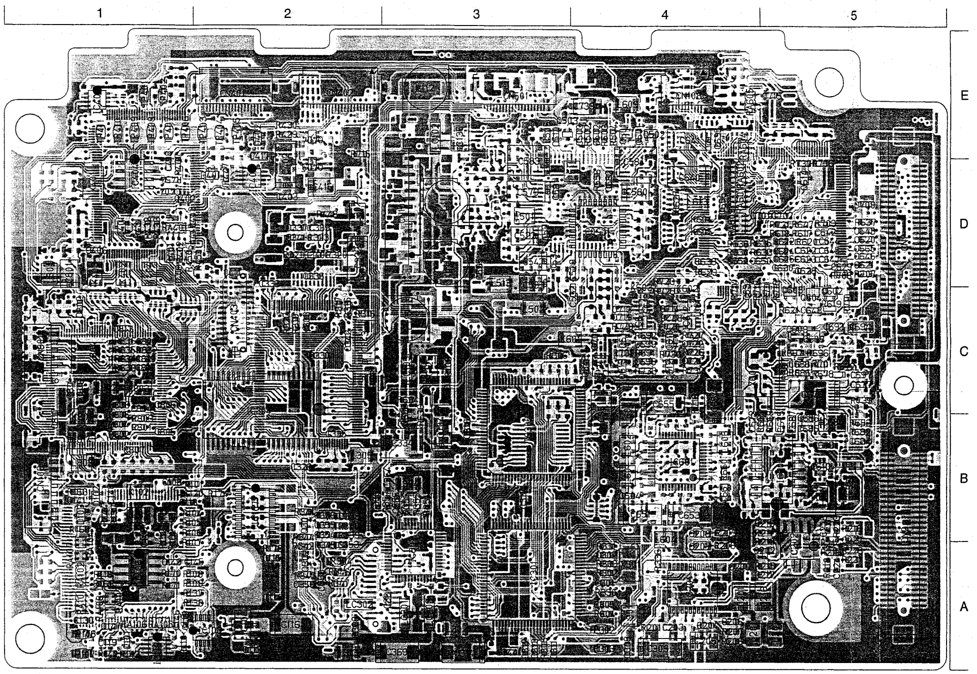

To
16 CAM2
CN1
Page 4-14
To
16 CAM2
CN2
Page 4-14
TO MSD CPU
TO CAS
TO DV_CPU
TO EQ_DA
TO MSD CPU
from DV_CPU
TO EQ_DA
TO EQ_DA
IC601
BH7086KV
IC603
M52387FP
IC604
M52684AFP
IC605
TC7SH08F
IC606
TC7SH00F
IC610
TC7SET04FU-X
Q605
2SC4081/QRS
Q602
2SC4081/QRS
Q603
2SC4081/QRS
Q604
OPEN
X601
503KHz
TP601
TP602
10 DV_MAIN(DV I/O)

Block Name	DV CPU	MSD CPU	EQ DA	DIGI IF	AUD AD/DA	CAS	DV I/O
Page	4-43	4-44	4-45	4-46	4-47	4-48	4-49

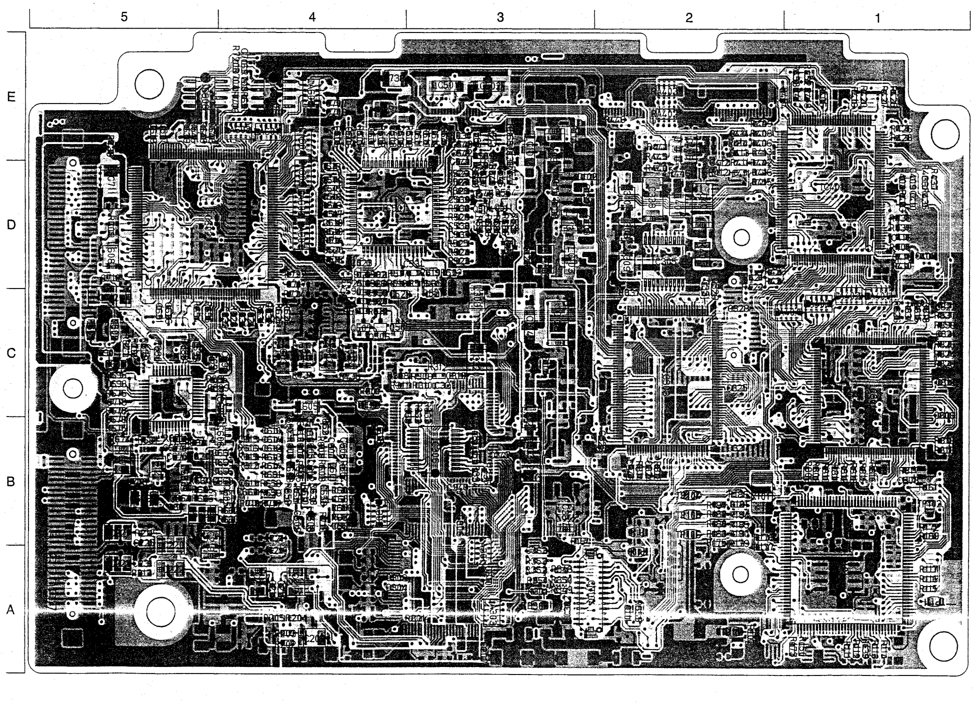

IC602
TBP90CF
A/D
A/D
SYNC
BFP
ENC
D/A
D/A
D/A
D/A
DV MASK
4:2:2→4:1:1 4:2:0
4:2:2→4:1:1 4:2:0
CTL
Signal Selector
IC607 DS90LV017TM (OPEN)
IC608 DS90LV018ATM (OPEN)
IC605 TC7SH08F
IC606 TC7SH00F
IC611 TC7SHU04FU
IC612 TC7SHU04FU
IC613 TC7SHU04FU
IC614 TC7SHU04FU
IC615 AN77L03M
Q602 2SC4081/QRS
Q603 2SC4081/QRS
Q604 OPEN
Q606 open
Q608 2SC4081/QRS
Q609 2SC4081/QRS
Q610 2SB1218A/PQ/-X
Q611 2SB1218A/PQ/-X
Q612 DTC144WUA-X
Q613 DTC144WUA-X
Q614 DTC144EUA-X
X602 27MHz
X603 26.995MHz
LA601 NQR0330-009X
LA602 NQR0330-009X
LA603 NQR0330-009X
LA604 NQR0330-009X
LA605 NQR0330-009X
LA606 NQR0320-010X
LA607 NQR0320-010X
TCK
TMS
FROM DV CPU (JIG)
INF
DIF_TDI
TO D_I/F
CAS_TDO
TO CAS
DSF7
DSF6
DSF5
DSF4
DSF3
DSF2
DSF1
DSF0
TO CAS
CLK18M1
CLK450K
CLK18M2
SHM225
VSP
HSP
FRP
TO CAS
CLK18M2
from D_I/F
V_DIC_RST
DIC_SIO
DIC_CLK
DIC_STP1
TO MSD CPU
MCVS
TO MSD CPU
FRP
TO DV CPU
27M_ON(H)
TO MSD CPU
25M_ON(H)
CLK27M
TO CAS
TINT2
TINT1
YDAVREF
TO EQ_DA
SYNC_ADJ
A_REG_5V
A_REG_3V
D_REG_3V
TO DV CPU (REG.)
REG_2.2V
GND
A_GND
TP601
TP602

4.32 DV MAIN CIRCUIT BOARD

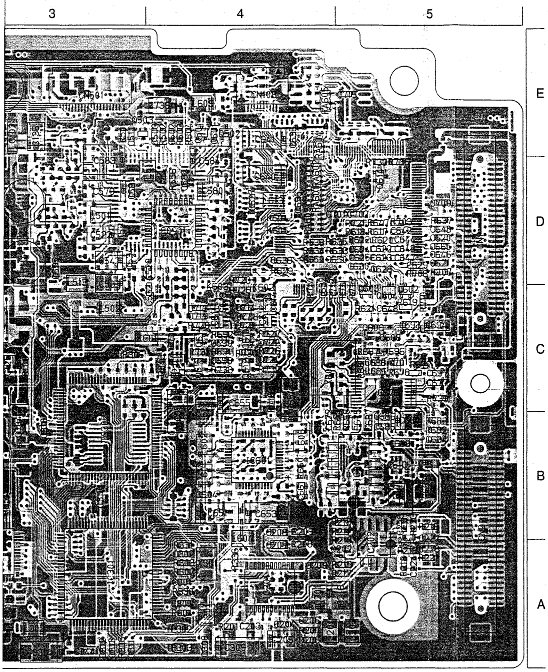
– SIDE A –


1
2
3
4
5
E
D
C
B
A

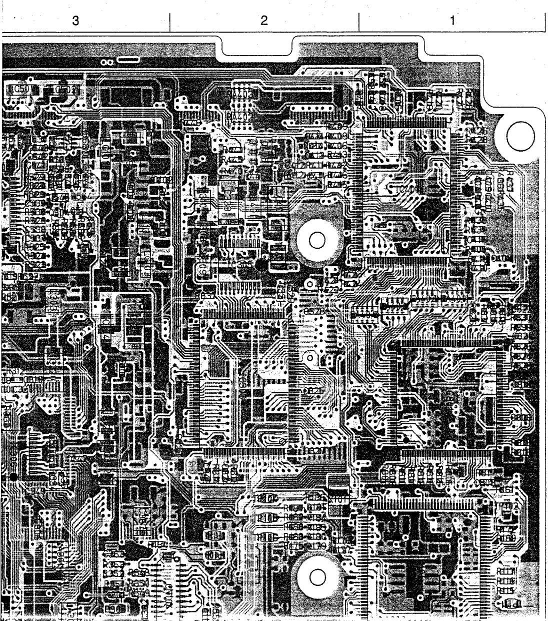
– SIDE B –


5
4
3
2
1
E
D
C
B
A

– SIDE A –



– SIDE B –



● **ADDRESS TABLE OF BOARD PARTS**

Each address may have an address error by one interval.

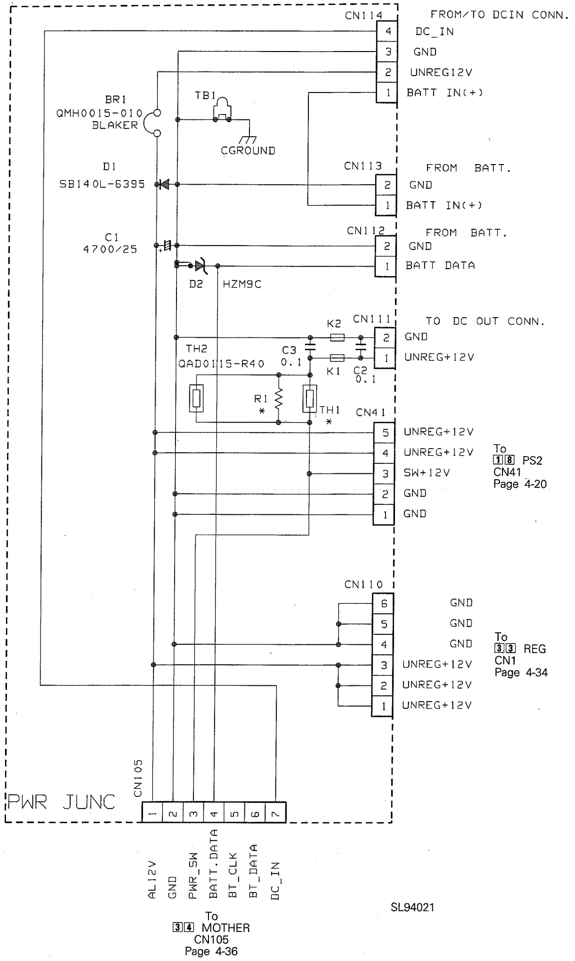
```
        A-1C
Side  ─┘│└── Y axis
        └─── X axis
```

IC101	B-1B	D402	A-2E	R221	A-5B	R422	B-2D	R565	B-3D	R681	B-5C	R826	B-1D
IC103	A-2B	D601	B-5D	R223	A-5C	R423	B-2D	R566	B-3D	R682	A-5C	R831	B-1D
IC105	A-1B			R301	B-3B	R424	B-2D	R567	B-3E	R683	A-5C	R832	A-1D
IC106	A-1B	R101	A-1C	R302	A-4B	R425	B-1E	R568	B-3E	R684	B-4C	R833	A-1C
IC107	A-2C	R103	B-2B	R303	A-4B	R426	B-1E	R601	B-4C	R685	B-4C	R834	A-1D
IC108	A-2B	R104	A-1C	R304	A-4B	R427	B-1E	R602	B-4C	R686	A-5C	R835	A-1D
IC113	A-1B	R105	A-1C	R305	A-3B	R428	B-1E	R603	B-4C	R687	A-5C	R836	A-1D
IC201	A-4B	R106	A-1B	R306	A-3D	R429	A-2E	R604	B-4C	R688	B-5D	R837	B-1D
IC202	A-5B	R107	A-1B	R307	B-4C	R430	A-2E	R605	B-4C	R690	B-5D	R838	B-1D
IC301	A-3B	R108	A-1B	R308	B-3C	R431	A-1D	R606	B-4C	R691	A-4D		
IC302	A-3C	R109	A-1B	R309	B-3C	R432	A-1D	R607	B-4C	R692	A-4D	C101	B-3E
IC303	B-2C	R110	A-1B	R310	B-3C	R433	A-1D	R608	B-4C	R694	A-3C	C102	B-2E
IC304	A-2C	R111	B-1B	R311	B-3C	R434	B-2E	R609	B-4C	R696	A-5D	C103	B-2D
IC305	B-2D	R112	B-1B	R312	B-3C	R435	B-1E	R610	B-4C	R697	A-5D	C104	B-3D
IC306	B-3C	R113	B-1B	R313	B-2C	R436	B-1E	R611	B-4C	R701	A-5D	C105	B-3D
IC307	A-3B	R114	B-1B	R314	B-2C	R437	B-1E	R612	B-4C	R702	B-5D	C106	A-3C
IC401	B-1E	R115	B-1B	R315	A-2D	R438	B-1D	R613	B-4C	R703	A-5D	C108	A-1C
IC402	A-1E	R116	B-1B	R316	A-2D	R439	B-1D	R614	B-4C	R704	B-4E	C109	B-3E
IC403	A-2E	R117	B-1B	R317	A-2D	R440	B-2E	R615	B-4C	R705	B-4E	C110	B-3E
IC404	A-1E	R118	A-1B	R319	A-2D	R441	B-2E	R616	B-4C	R706	B-4E	C111	B-2B
IC501	B-3E	R137	A-1B	R320	A-2D	R442	B-2E	R617	A-5D	R707	A-5D	C112	A-1B
IC503	A-4D	R138	A-1B	R321	A-2D	R443	A-1D	R618	A-4D	R708	A-5D	C113	A-2B
IC601	A-4C	R139	B-1B	R322	A-2D	R444	A-1D	R619	A-5D	R709	B-5D	C114	A-2B
IC602	B-4D	R142	A-1B	R323	A-2D	R445	B-2E	R620	A-5D	R710	A-5D	C115	A-2B
IC603	B-5C	R143	A-1B	R330	A-4B	R446	B-2E	R621	A-5D	R711	A-4D	C116	A-2B
IC604	A-4C	R144	A-1C	R331	A-4B	R447	A-2E	R622	A-4D	R712	A-4D	C117	A-1C
IC605	B-4C	R150	B-1B	R332	B-3C	R448	A-2D	R623	B-4D	R713	A-4D	C118	A-1C
IC606	B-4C	R152	A-1B	R333	B-3C	R449	B-2E	R624	B-4D	R714	A-4D	C119	A-1B
IC607	B-4E	R157	A-1C	R334	B-3C	R450	A-1D	R625	B-4D	R715	A-2E	C120	A-1C
IC608	B-4E	R161	B-1C	R335	B-3C	R451	A-2D	R626	B-4D	R716	B-4C	C125	A-3C
IC610	A-5C	R162	A-1B	R336	A-4B	R452	B-1E	R629	A-4D	R717	B-4C	C126	B-3D
IC611	A-4D	R163	A-1C	R337	B-2D	R453	B-1E	R631	B-4D	R718	B-4C	C127	B-3D
IC612	A-4D	R164	B-3B	R338	B-3C	R454	A-1E	R632	B-4D	R719	A-4C	C128	B-3D
IC613	A-4D	R168	A-1B	R339	A-2B	R502	A-4E	R633	A-4D	R720	B-4E	C130	A-1B
IC614	A-4D	R169	A-1B	R340	A-2C	R503	A-4E	R634	A-4D	R721	A-4D	C135	A-3E
IC615	B-4E	R170	A-1B	R341	A-2C	R504	A-4E	R635	A-4D	R722	B-4D	C136	B-3E
IC801	B-1C	R171	A-1B	R342	A-2B	R505	A-3E	R636	A-4D	R723	A-4D	C141	A-1C
		R172	B-1C	R343	A-2B	R507	B-4E	R637	A-5D	R724	B-4D	C145	A-1B
Q101	A-1B	R173	B-1B	R344	A-2B	R508	B-4E	R638	B-4C	R725	A-4D	C146	A-1B
Q202	A-4B	R174	A-2C	R345	A-2B	R509	B-3E	R639	A-3C	R726	A-4D	C147	A-1B
Q301	A-2C	R175	B-2B	R346	A-2B	R510	B-3E	R645	B-5E	R727	A-4D	C148	A-1C
Q302	A-2B	R176	B-2B	R347	A-2B	R511	B-4D	R646	B-4E	R728	A-4D	C149	A-1B
Q401	A-1D	R177	B-2B	R348	B-3B	R512	B-4D	R647	A-5D	R729	A-4D	C150	B-2E
Q402	A-1E	R178	A-2B	R349	B-3B	R513	B-4E	R651	B-4E	R730	A-4D	C201	A-4B
Q403	A-2E	R179	B-2B	R350	B-3B	R514	B-4D	R652	B-4C	R731	A-4D	C202	B-4B
Q404	A-2E	R180	B-2B	R351	B-3B	R515	B-4D	R653	B-4C	R732	A-4C	C203	A-4B
Q405	B-2E	R181	B-2C	R352	B-3B	R516	B-3D	R654	B-4D	R733	A-4C	C204	A-4B
Q501	A-4E	R182	B-2C	R353	B-3B	R517	B-3D	R655	B-4D	R734	B-4C	C205	A-4B
Q502	A-4E	R183	B-2B	R354	A-3C	R518	B-3D	R656	B-4C	R735	B-4C	C206	A-4B
Q503	A-3E	R184	B-2C	R355	A-3C	R519	B-3D	R657	B-4C	R736	A-5E	C207	A-4B
Q504	B-3D	R185	B-2C	R356	A-3C	R520	B-3D	R658	B-4C	R737	A-5E	C208	A-4B
Q505	B-3D	R186	B-2C	R357	A-2C	R521	B-3D	R659	B-4C	R738	B-5E	C209	A-4B
Q506	B-4D	R187	B-2C	R401	A-1D	R522	B-3D	R660	A-4C	R739	A-5C	C210	B-4B
Q507	B-4D	R188	B-2C	R402	A-1D	R523	B-3D	R661	B-4C	R801	A-1C	C211	B-4B
Q511	B-3D	R189	B-1B	R403	B-1E	R524	B-3D	R662	B-4C	R802	A-1C	C212	B-4B
Q512	B-3D	R201	A-4B	R404	B-1E	R525	B-3D	R663	B-4C	R803	A-1C	C213	B-4B
Q513	B-3E	R202	B-4B	R405	B-1D	R526	B-3D	R664	B-4C	R804	A-1C	C214	B-4B
Q602	A-5D	R203	B-4B	R406	B-2E	R527	B-3E	R665	B-4C	R805	A-1C	C215	B-4B
Q603	A-5D	R204	B-4B	R407	A-1E	R528	B-3E	R666	B-4C	R806	A-1C	C216	A-4B
Q604	A-5D	R205	B-4B	R408	B-2E	R529	B-3E	R667	A-4C	R808	B-1C	C217	A-4B
Q605	B-4C	R206	A-4B	R409	B-2E	R530	B-3E	R668	A-4C	R809	B-1C	C218	A-4C
Q606	A-3C	R207	A-4B	R410	B-1D	R533	B-3D	R669	B-4C	R810	B-1C	C219	B-4B
Q608	A-5D	R208	A-4B	R411	B-2E	R534	B-3D	R670	B-4C	R811	B-1C	C220	B-5B
Q609	A-5D	R209	A-4B	R412	B-2E	R535	B-3D	R671	B-5C	R812	B-1C	C221	B-5B
Q610	A-4D	R210	A-4B	R413	B-2E	R536	B-3D	R672	A-5C	R813	B-1C	C222	B-5B
Q611	A-4D	R211	A-4B	R414	B-2E	R537	B-3E	R673	B-5C	R815	B-1C	C223	B-5B
Q612	A-4C	R212	B-5B	R415	B-2E	R538	B-3E	R674	B-5C	R816	B-1C	C224	A-5B
Q613	A-4C	R214	A-5B	R416	B-2E	R539	B-3E	R675	B-5C	R817	B-1C	C225	B-5B
Q614	A-5E	R215	A-4B	R417	B-1E	R540	B-3E	R676	B-5C	R818	B-1C	C226	A-5C
		R216	A-5B	R418	B-1E	R541	B-3E	R677	B-5D	R819	B-1C	C227	A-5B
D102	A-1C	R217	B-5B	R419	B-1E	R555	B-2B	R678	A-5C	R823	B-1D	C228	A-5B
D103	A-1C	R218	A-5B	R420	B-1E	R556	A-4E	R679	B-5D	R824	B-1D	C231	B-5B
D401	A-2E	R219	A-5B	R421	B-2D	R564	B-3E	R680	B-5D	R825	B-1D	C301	A-4B

4.27 PWR JUNC, OPE(OPEration) SCHEMATIC DIAGRAM 41/35

· PWR JUNC 41

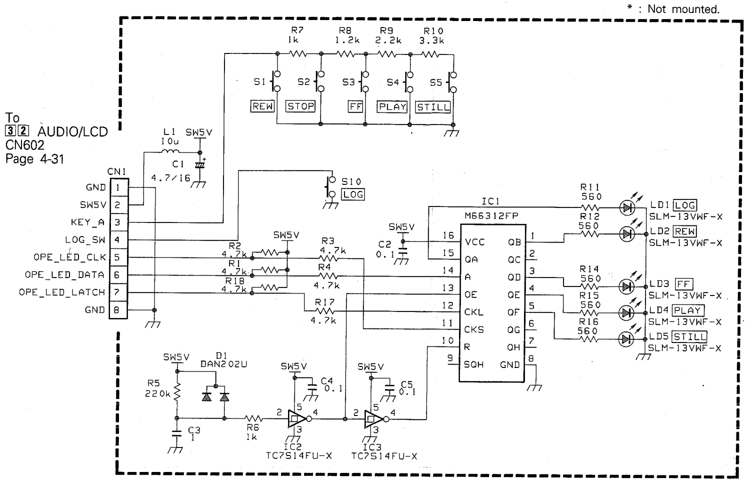
* : Not mounted.


CN114
FROM/TO DCIN CONN.
4 DC_IN
3 GND
2 UNREG12V
1 BATT IN(+)
BR1
QMH0015-010
BLAKER
TB1
CGROUND
D1
SB140L-6395
CN113
FROM BATT.
2 GND
1 BATT IN(+)
C1
4700/25
CN112
FROM BATT.
2 GND
1 BATT DATA
D2
HZM9C
K2
CN111
TO DC OUT CONN.
2 GND
1 UNREG+12V
TH2
QAD0115-R40
C3
0.1
K1
C2
0.1
R1
*
TH1
*
CN41
5 UNREG+12V
4 UNREG+12V
3 SW+12V
2 GND
1 GND
To
18 PS2
CN41
Page 4-20
CN110
6 GND
5 GND
4 GND
3 UNREG+12V
2 UNREG+12V
1 UNREG+12V
To
33 REG
CN1
Page 4-34
PWR JUNC
CN105
1 AL12V
2 GND
3 PWR_SW
4 BATT.DATA
5 BT_CLK
6 BT_DATA
7 DC_IN
To
34 MOTHER
CN105
Page 4-36

SL94021

· OPE 35

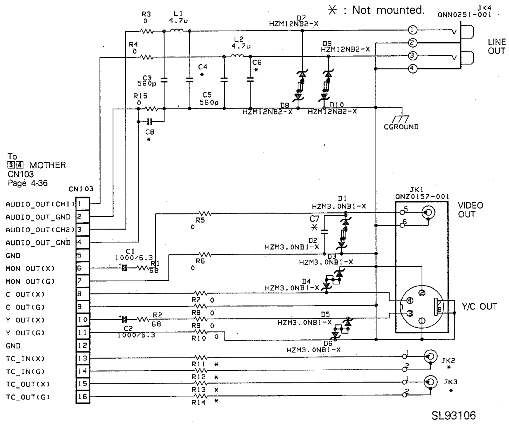
* : Not mounted.


To
32 AUDIO/LCD
CN602
Page 4-31
CN1
1 GND
2 SW5V
3 KEY_A
4 LOG_SW
5 OPE_LED_CLK
6 OPE_LED_DATA
7 OPE_LED_LATCH
8 GND
L1
10u
SW5V
C1
4.7/16
R7
1k
R8
1.2k
R9
2.2k
R10
3.3k
S1
REW
S2
STOP
S3
FF
S4
PLAY
S5
STILL
S10
LOG
SW5V
R2
4.7k
R1
4.7k
R18
4.7k
R3
4.7k
R4
4.7k
R17
4.7k
SW5V
C2
0.1
IC1
M66312FP
16 VCC
15 QA
14 A
13 OE
12 CKL
11 CKS
10 R
9 SQH
QB 1
QC 2
QD 3
QE 4
QF 5
QG 6
QH 7
GND 8
R11
560
R12
560
R14
560
R15
560
R16
560
LD1 LOG
SLM-13VWF-X
LD2 REW
SLM-13VWF-X
LD3 FF
SLM-13VWF-X
LD4 PLAY
SLM-13VWF-X
LD5 STILL
SLM-13VWF-X
SW5V
R5
220k
D1
DAN202U
C3
1
R6
1k
SW5V
C4
0.1
IC2
TC7S14FU-X
SW5V
C5
0.1
IC3
TC7S14FU-X

SL94022

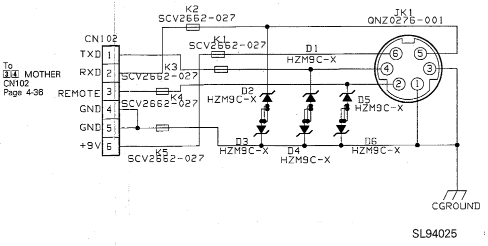
4.28 CONNECT, REMOTE, XLR, EAR.J, SEN1, SENS2 SCHEMATIC DIAGRAM 42/38/40/43/36/37

· CONNECT 42



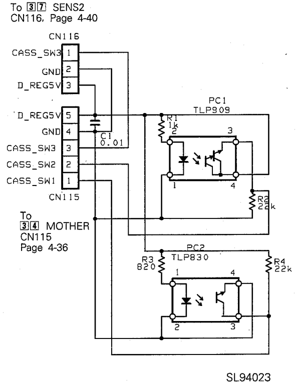
※ : Not mounted.
JK4
QNN0251-001
LINE OUT
R3 0
L1 4.7u
R4 0
L2 4.7u
C6 *
C4 *
C3 560p
C5 560p
R15 0
C8 *
D7 HZM12NB2-X
D9 HZM12NB2-X
D8 HZM12NB2-X
D10 HZM12NB2-X
CGROUND
To 34 MOTHER CN103 Page 4-36
CN103
AUDIO_OUT(CH1)
AUDIO_OUT_GND
AUDIO_OUT(CH2)
AUDIO_OUT_GND
GND
MON OUT(X)
MON OUT(G)
C OUT(X)
C OUT(G)
Y OUT(X)
Y OUT(G)
GND
TC_IN(X)
TC_IN(G)
TC_OUT(X)
TC_OUT(G)
JK1
QNZ0157-001
VIDEO OUT
Y/C OUT
D1 HZM3.0NB1-X
C7 *
D2 HZM3.0NB1-X
D3 HZM3.0NB1-X
D4 HZM3.0NB1-X
D5 HZM3.0NB1-X
D6 HZM3.0NB1-X
R5 0
R6 0
C1 1000/6.3
R1 68
R7 0
R8 0
R9 0
R10 0
R2 68
C2 1000/6.3
R11 *
R12 *
R13 *
R14 *
JK2 *
JK3 *
SL93106

· REMOTE 38



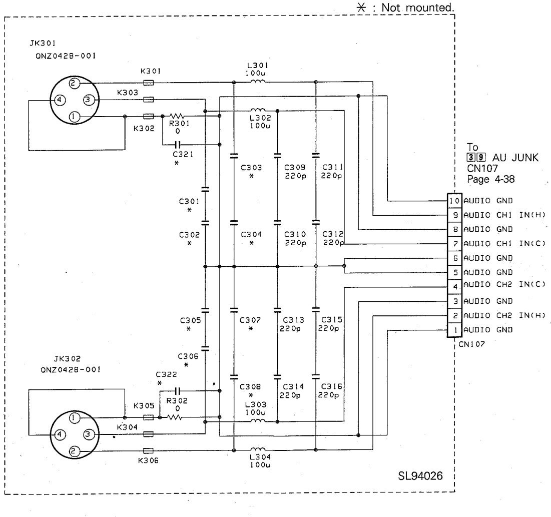
K2 SCV2662-027
K1 SCV2662-027
K3 SCV2662-027
K4 SCV2662-027
K5 SCV2662-027
JK1 QNZ0276-001
CN102
TXD
RXD
REMOTE
GND
GND
+9V
To 34 MOTHER CN102 Page 4-36
D1 HZM9C-X
D2 HZM9C-X
D3 HZM9C-X
D4 HZM9C-X
D5 HZM9C-X
D6 HZM9C-X
CGROUND
SL94025

· SEN1 36



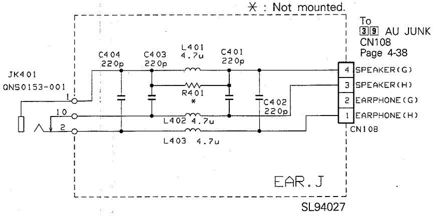
To 37 SENS2 CN116, Page 4-40
CN116
CASS_SW3
GND
D_REG5V
D_REG5V
GND
CASS_SW3
CASS_SW2
CASS_SW1
CN115
To 34 MOTHER CN115 Page 4-36
C1 0.01
PC1 TLP909
R1 1k
R2 22k
PC2 TLP830
R3 820
R4 22k
SL94023

· XLR 40



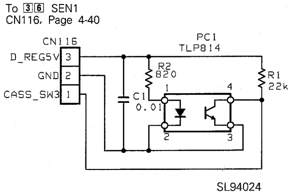
※ : Not mounted.
JK301
QNZ0428-001
K301
K303
K302
R301 0
C321 *
L301 100u
L302 100u
C301 *
C302 *
C303 *
C304 *
C309 220p
C310 220p
C311 220p
C312 220p
C305 *
C306 *
C307 *
C308 *
C313 220p
C314 220p
C315 220p
C316 220p
C322 *
R302 0
K305
K304
K306
L303 100u
L304 100u
JK302
QNZ0428-001
To 39 AU JUNK CN107 Page 4-38
AUDIO GND
AUDIO CH1 IN(H)
AUDIO GND
AUDIO CH1 IN(C)
AUDIO GND
AUDIO GND
AUDIO CH2 IN(C)
AUDIO GND
AUDIO CH2 IN(H)
AUDIO GND
CN107
SL94026

· EAR.J 43



※ : Not mounted.
To 39 AU JUNK CN108 Page 4-38
JK401
QNS0153-001
C404 220p
C403 220p
L401 4.7u
C401 220p
R401 *
C402 220p
L402 4.7u
L403 4.7u
SPEAKER(G)
SPEAKER(H)
EARPHONE(G)
EARPHONE(H)
CN108
EAR.J
SL94027

· SENS2 37

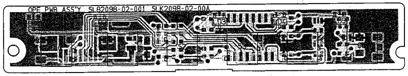


To 36 SEN1 CN116, Page 4-40
CN116
D_REG5V
GND
CASS_SW3
PC1 TLP814
R2 820
R1 22k
C1 0.01
SL94024

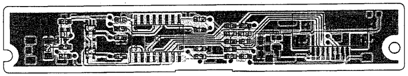
4.29 OPE, PWR JUNC, CONNECT, REMOTE, XLR, EAR.J, SEN1, SENS2 CIRCUIT BOARD

· OPE

– SIDE A –

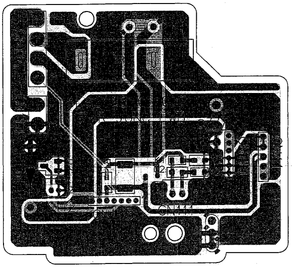

OPE PWB ASS'Y SL82098-02-001 SLK2098-02-00A

– SIDE B –



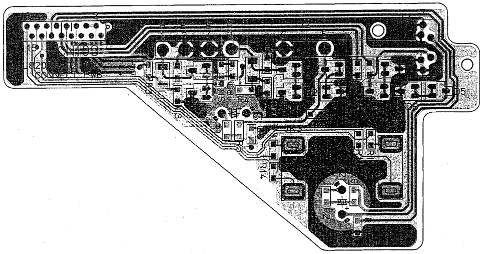
· PWR JUNC

– SIDE B –



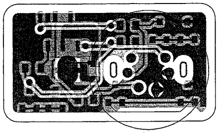
· CONNECT

– SIDE B –


CONNECT PWB

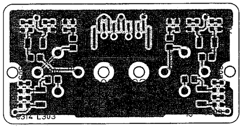
· REMOTE

– SIDE B –



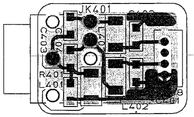
· XLR

– SIDE B –



· EAR.J

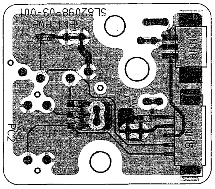
– SIDE B –


JK401
C403
R401
L401
L402
C401

SL82093-03-002

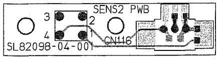
· SEN1

– SIDE A –

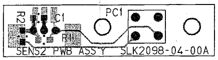


· SENS2

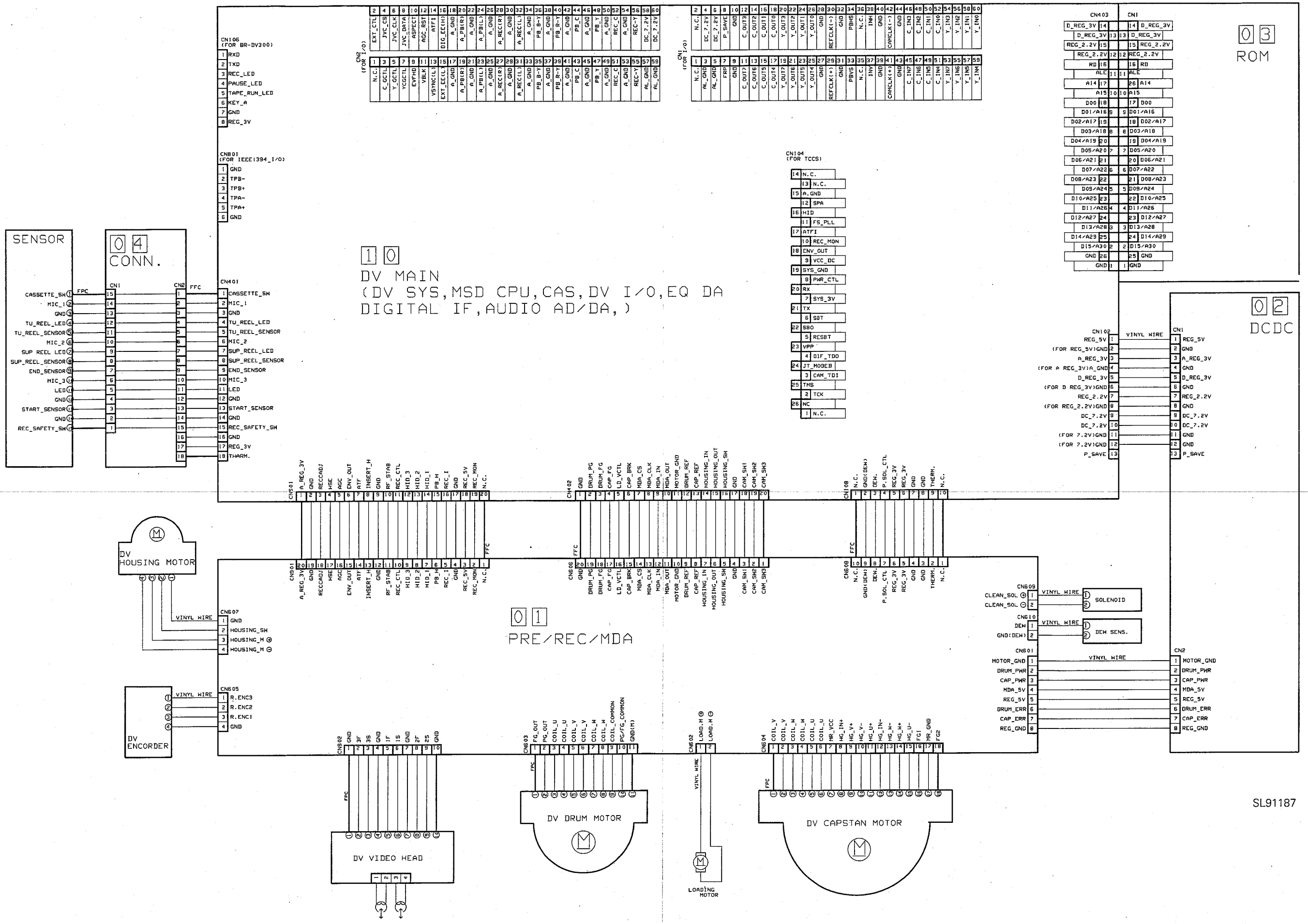
– SIDE A –


SENS2 PWB
3
4
2
1
SL82098-04-001
CN116

– SIDE B –

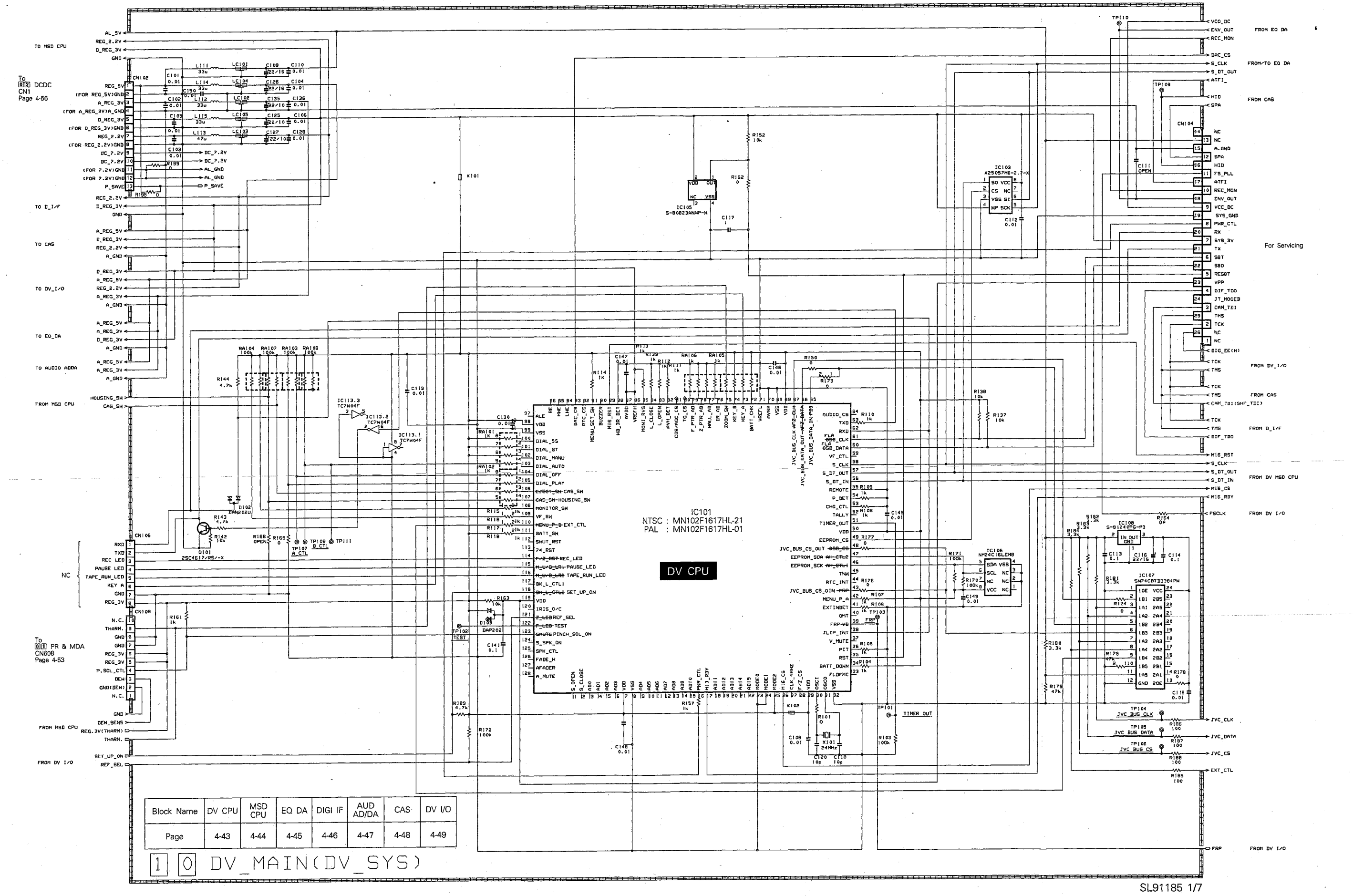

R2
C1
PC1
R1
SENS2 PWB ASS'Y SLK2098-04-00A

4.30 VTR UNIT OVERALL WIRING DIAGRAM


10 DV MAIN
(DV SYS,MSD CPU,CAS,DV I/O,EQ DA
DIGITAL IF,AUDIO AD/DA,)
01 PRE/REC/MDA
02 DCDC
03 ROM
04 CONN.
SENSOR
DV HOUSING MOTOR
DV ENCORDER
DV VIDEO HEAD
DV DRUM MOTOR
LOADING MOTOR
DV CAPSTAN MOTOR
SOLENOID
DEW SENS.
CN106 (FOR BR-DV300)
RXD
TXD
REC_LED
PAUSE_LED
TAPE_RUN_LED
KEY_A
GND
REG_3V
CN801 (FOR IEEE1394_I/O)
GND
TPB-
TPB+
TPA-
TPA+
GND
CN401
CASSETTE_SW
MIC_1
GND
TU_REEL_LED
TU_REEL_SENSOR
MIC_2
SUP_REEL_LED
SUP_REEL_SENSOR
END_SENSOR
MIC_3
LED
GND
START_SENSOR
GND
REC_SAFETY_SW
GND
REG_3V
THARM.
CN2 (FOR I/O)
CN1 (FOR I/O)
CN104 (FOR TCCS)
CN403
CN1
CN102
REG_5V
A_REG_3V
D_REG_3V
REG_2.2V
DC_7.2V
P_SAVE
VINYL WIRE
FPC
FFC
CN501
CN402
CN108
CN901
CN606
CN608
CN607
GND
HOUSING_SW
HOUSING_M ⊕
HOUSING_M ⊖
CN605
R.ENC3
R.ENC2
R.ENC1
GND
CN609
CLEAN_SOL ⊕
CLEAN_SOL ⊖
CN610
DEW
GND(DEW)
CN601
MOTOR_GND
DRUM_PWR
CAP_PWR
MDA_5V
REG_5V
DRUM_ERR
CAP_ERR
REG_GND
CN602
CN603
CN602
LOAD_M ⊕
LOAD_M ⊖
CN604
SL91187

4.31 DV MAIN SCHEMATIC DIAGRAM (1/7) 1 0

– DV CPU –


To 02 DCDC CN1 Page 4-56
TO MSD CPU
TO D_I/F
TO CAS
TO DV_I/O
TO EQ_DA
TO AUDIO ADDA
FROM MSD CPU
NC
To 01 PR & MDA CN608 Page 4-53
FROM MSD CPU
FROM DV I/O
CN102
CN106
CN108
CN104
FROM EQ DA
FROM/TO EQ DA
FROM CAS
For Servicing
FROM DV_I/O
FROM CAS
FROM D_I/F
FROM DV MSD CPU
FROM DV I/O
FROM DV I/O
IC101
NTSC : MN102F1617HL-21
PAL : MN102F1617HL-01
DV CPU
IC103 X25057MB-2.7-X
IC105 S-80823ANNP-H
IC106 NM24C16LEM8
IC107 SN74CBTD3384PW
IC108 S-81240PG-P3
IC113.3 TC7W04F
IC113.2 TC7W04F
IC113.1 TC7W04F
Q101 2SC4617/RS/-X
D102 DAN202U
D103 DAP202
X101 24MHz
TP102 TEST
TP103 FRP
TP101 TIMER OUT
TP104 JVC BUS CLK
TP105 JVC BUS DATA
TP106 JVC BUS CS
TP107 A_CTL
TP108 B_CTL
TP109
TP110
TP111
JVC_CLK
JVC_DATA
JVC_CS
EXT_CTL
FRP
FSCLK
1 0 DV_MAIN(DV_SYS)

Block Name	DV CPU	MSD CPU	EQ DA	DIGI IF	AUD AD/DA	CAS	DV I/O
Page	4-43	4-44	4-45	4-46	4-47	4-48	4-49

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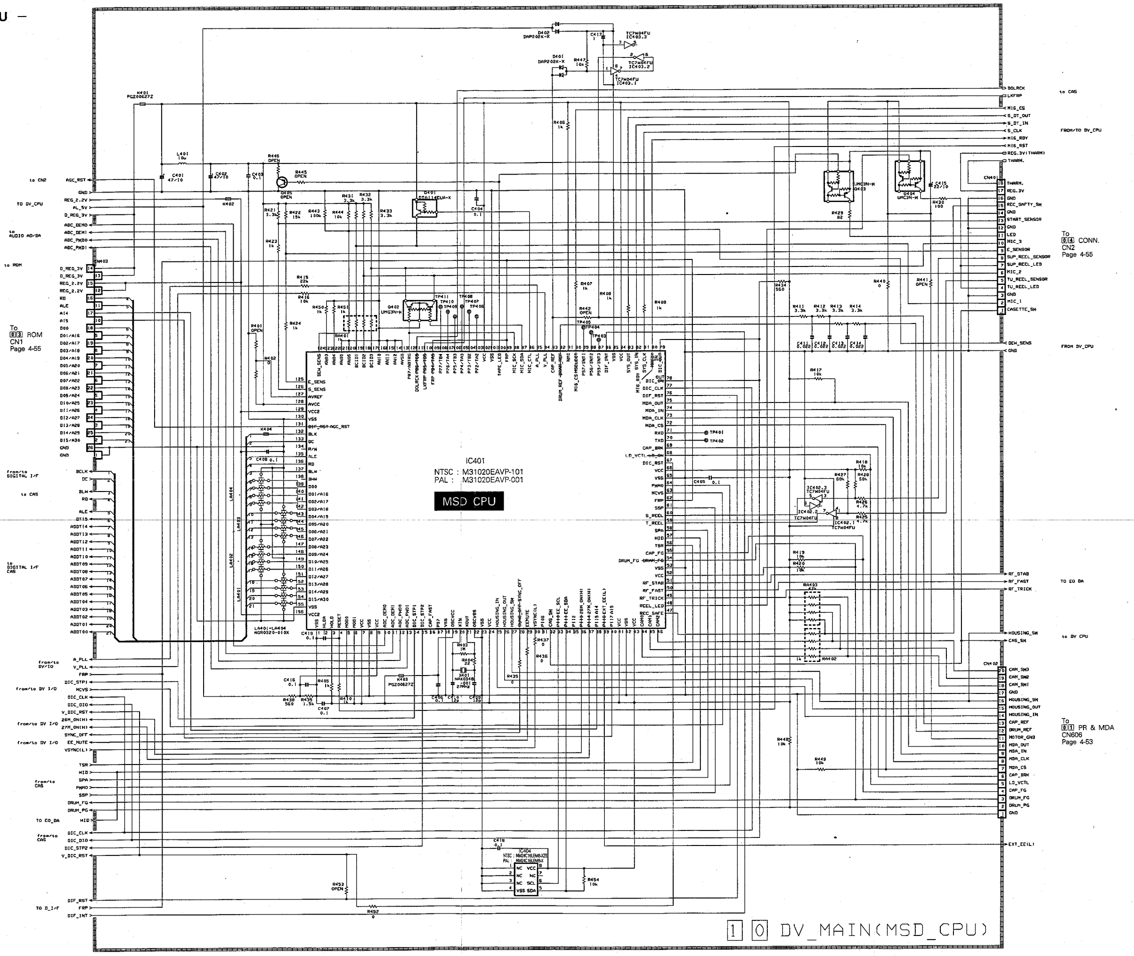
· DV MAIN SCHEMATIC DIAGRAM (2/7) 1 0

– MSD(Mechacon Servo Digi if) CPU –

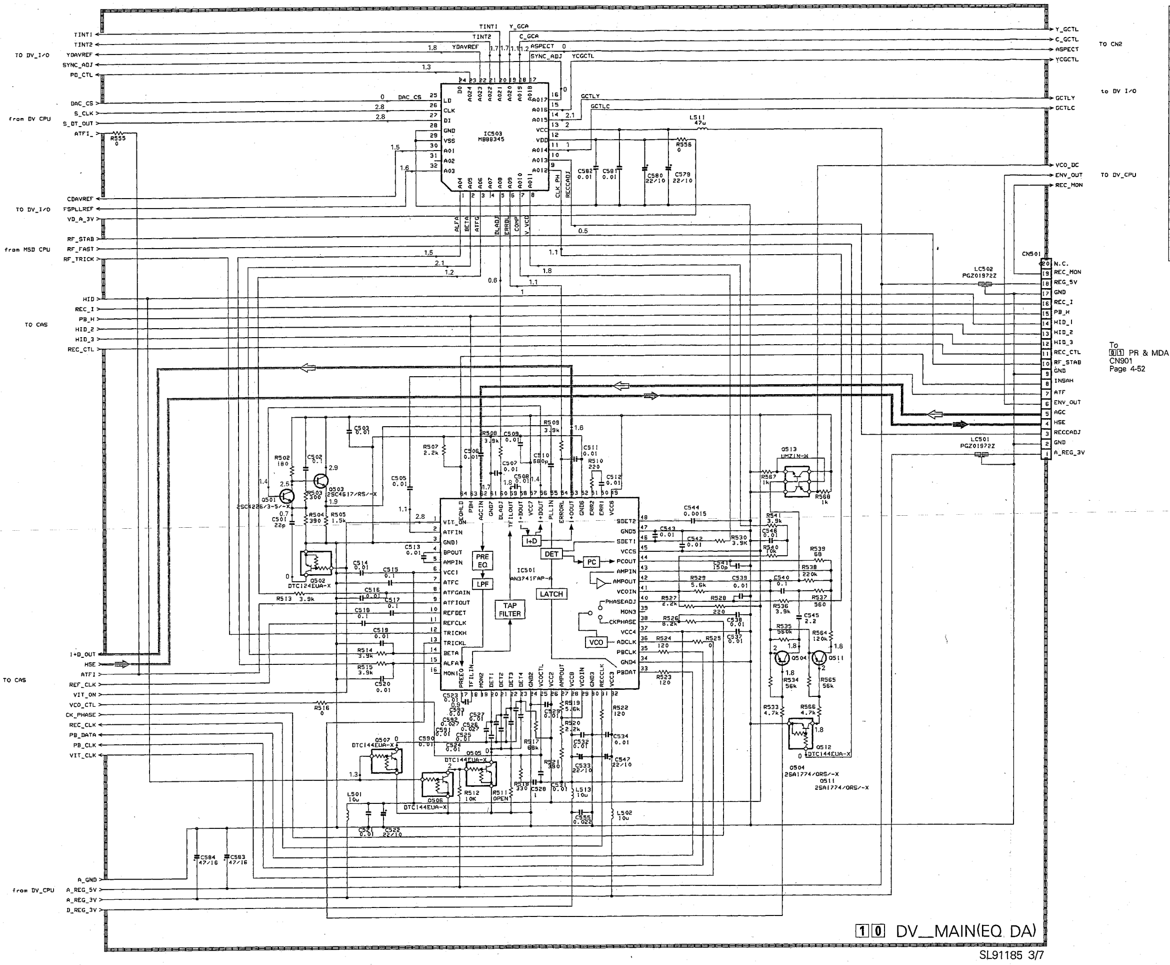

IC401
NTSC : M31020EAVP-101
PAL : M31020EAVP-001
MSD CPU
to CN2
TO DV_CPU
to AUDIO AD/DA
to ROM
To 0 8 ROM CN1 Page 4-55
from/to DIGITAL I/F
to CAS
to DIGITAL I/F CAS
from/to DV/IO
from/to DV I/O
from/to CAS
TO EQ_DA
TO D_I/F
to CAS
FROM/TO DV_CPU
To 0 4 CONN. CN2 Page 4-55
FROM DV_CPU
TO EQ DA
to DV CPU
To 0 1 PR & MDA CN606 Page 4-53
CN401
CN402
CN403
IC403 TC7W04FU
IC402 TC7W04FU
IC404 NTSC : NM24C16LEM8-XZB PAL : NM24C16LEM8-X
D401 DAP202K-X
D402 DAP202K-X
Q401 DTA114EUA-X
Q402 UMC3N-M
Q403 UMC3N-M
Q404 UMC3N-M
Q405
X401 NX4034B 27MHz
L401 10u
LA401–LA404 NGR0320-010X
PGZ00627Z
1 0 DV_MAIN(MSD_CPU)

SL91185 2/7

Block Name	Page
DV CPU	4-43
MSD CPU	4-44
EQ DA	4-45
DIGI IF	4-46
AUD AD/DA	4-47
CAS	4-48
DV I/O	4-49

· DV MAIN SCHEMATIC DIAGRAM (3/7) 10

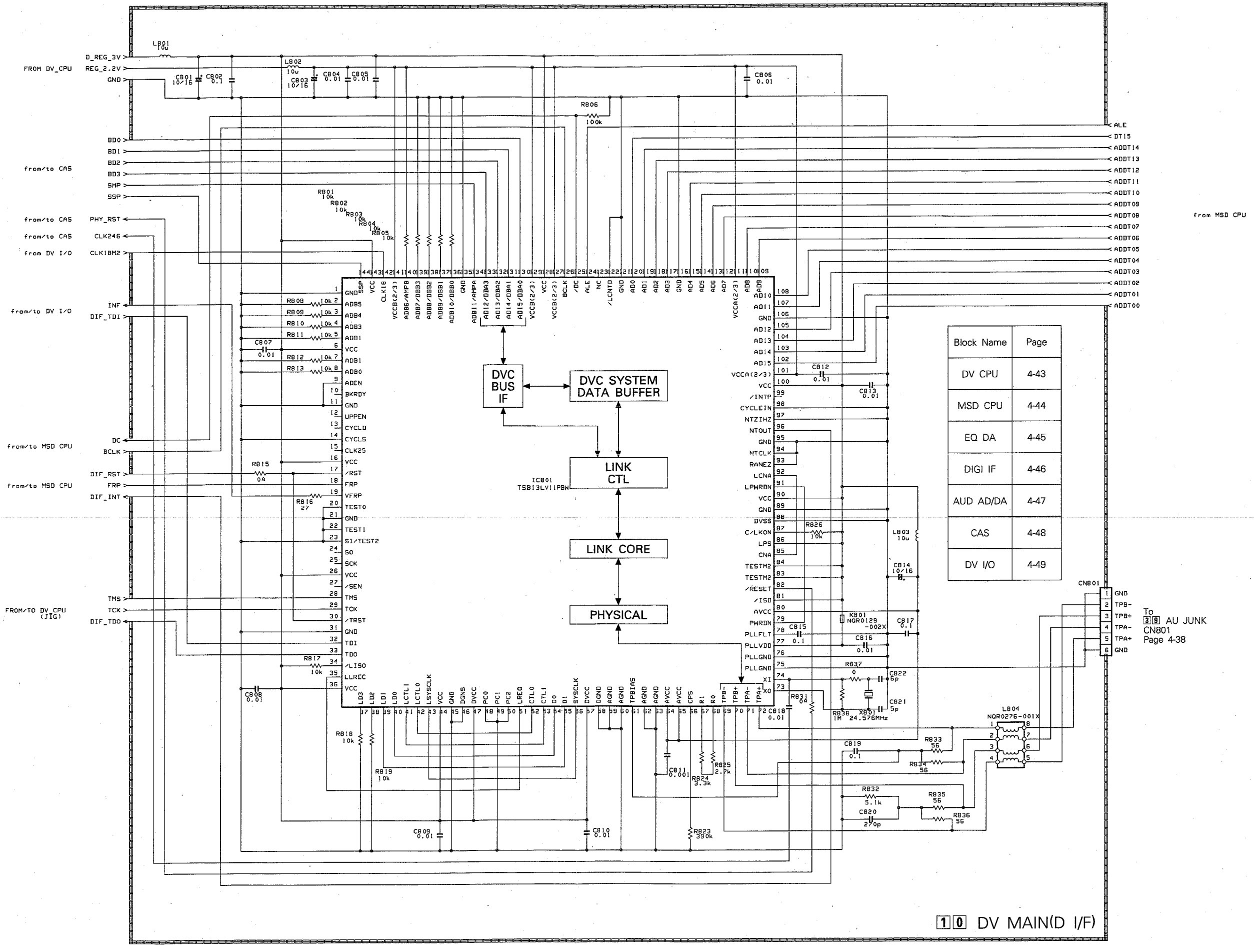
– EQ DA –


TINT1
TINT2
YDAVREF
SYNC_ADJ
PD_CTL
TO DV_I/O
DAC_CS
S_CLK
S_DT_OUT
ATFI
from DV CPU
R555 0
CDAVREF
FSPLLREF
VD_A_3V
TO DV_I/O
RF_STAB
RF_FAST
RF_TRICK
from MSD CPU
HID
REC_I
PB_H
HID_2
HID_3
REC_CTL
TO CAS
Y_GCA
C_GCA
ASPECT
SYNC_ADJ
YCGCTL
Y_GCTL
C_GCTL
ASPECT
YCGCTL
TO CN2
GCTLY
GCTLC
to DV I/O
IC503
MB88345
LD
CLK
DI
GND
VSS
AO1
AO2
AO3
DAC_CS
L511 47u
R556 0
C582 0.01
C581 0.01
C580 22/10
C579 22/10
VCO_DC
ENV_OUT
REC_MON
TO DV_CPU
ALFA
BETA
ATFG
DLADJ
ERRBL
COMP
V_VCO
CLK_PH
RECCADJ
CN501
N.C.
REC_MON
REG_5V
GND
REC_I
PB_H
HID_I
HID_2
HID_3
REC_CTL
RF_STAB
GND
INSAH
ATF
ENV_OUT
AGC
HSE
RECCADJ
GND
A_REG_3V
LC502 PGZ01972Z
LC501 PGZ01972Z
To 01 PR & MDA CN901 Page 4-52
IC501
AN3741FAP-A
PRE EQ
LPF
TAP FILTER
I+D
DET
PC
LATCH
VCO
VIT_ON
ATFIN
GND1
BPOUT
AMPIN
VCC1
ATFC
ATFGAIN
ATFIOUT
REFDET
REFCLK
TRICKH
TRICKL
BETA
ALFA
MONI
SDET2
GND5
SDET1
VCC5
PCOUT
AMPIN
AMPOUT
VCOIN
PHASEADJ
MON3
CKPHASE
VCC4
ADCLK
PBCLK
GND4
PBDAT
Q501 2SC4226/3-5/-X
Q502 DTC124EUA-X
Q503 2SC4617/R5/-X
Q504 2SA1774/QRS/-X
Q505 DTC144EUA-X
Q506 DTC144EUA-X
Q507 DTC144EUA-X
Q511 2SA1774/QRS/-X
Q512 DTC144EUA-X
Q513 UMZ1N-N
R502 180
R503 300
R504 390
R505 1.5k
R507 2.2k
R508 3.9k
R509 3.9k
R510 220
R511 OPEN
R512 10K
R513 3.9k
R514 3.9k
R515 3.9k
R516 0
R517 68k
R518 330
R519 5.6k
R520 2.2k
R521 390
R522 120
R523 120
R524 120
R525 0
R526 8.2k
R527 2.2k
R528 220
R529 5.6k
R530 3.9K
R533 4.7k
R534 56k
R535 560k
R536 3.9k
R537 560
R538 220k
R539 68
R540 10k
R541 3.9k
R564 120k
R565 56k
R566 4.7k
R567 1k
R568 1k
C501 22p
C502 0.1
C503 0.01
C505 0.01
C506 0.01
C507 0.01
C508 0.01
C509 0.01
C510 68p
C511 0.01
C512 0.01
C513 0.01
C514 0.01
C515 0.1
C516 0.01
C517 0.1
C518 0.1
C519 0.01
C520 0.01
C521 0.01
C522 22/10
C528 1
C532 0.01
C533 22/10
C534 0.01
C537 0.01
C538 0.01
C539 0.01
C540 0.1
C542 0.01
C543 0.01
C544 0.0015
C545 2.2
C546 0.01
C547 22/10
C555 0.022
C583 47/16
C584 47/16
L501 10u
L502 10u
L513 10u
I+D_OUT
HSE
ATFI
REF_CLK
VIT_ON
VCO_CTL
CK_PHASE
REC_CLK
PB_DATA
PB_CLK
VIT_CLK
TO CAS
A_GND
A_REG_5V
A_REG_3V
D_REG_3V
from DV_CPU
10 DV_MAIN(EQ DA)
SL91185 3/7

Block Name	Page
DV CPU	4-43
MSD CPU	4-44
EQ DA	4-45
DIGI IF	4-46
AUD AD/DA	4-47
CAS	4-48
DV I/O	4-49

· DV MAIN SCHEMATIC DIAGRAM (4/7) 1 0

– DIGI IF –


FROM DV_CPU
D_REG_3V
REG_2.2V
GND
from/to CAS
BD0
BD1
BD2
BD3
SMP
SSP
from/to CAS
PHY_RST
from/to CAS
CLK246
from DV I/O
CLK18M2
from/to DV I/O
INF
DIF_TDI
from/to MSD CPU
DC
BCLK
DIF_RST
from/to MSD CPU
FRP
DIF_INT
FROM/TO DV_CPU (JIG)
TMS
TCK
DIF_TDO
ALE
DT15
ADDT14
ADDT13
ADDT12
ADDT11
ADDT10
ADDT09
ADDT08
ADDT07
ADDT06
ADDT05
ADDT04
ADDT03
ADDT02
ADDT01
ADDT00
from MSD CPU
L801 10u
L802 10u
C801 10/16
C802 0.1
C803 10/16
C804 0.01
C805 0.01
C806 0.01
R806 100k
R801 10k
R802 10k
R803 10k
R804 10k
R805 10k
R808 10k
R809 10k
R810 10k
R811 10k
R812 10k
R813 10k
C807 0.01
R815 0Ω
R816 27
R817 10k
C808 0.01
R818 10k
R819 10k
C809 0.01
C810 0.01
C811 0.001
R824 3.3k
R825 2.7k
R823 390k
C812 0.01
C813 0.01
R826 10k
L803 10u
C814 10/16
K801 NQR0129-002X
C817 0.1
C815 0.1
C816 0.01
R837 0
C822 6p
C821 5p
X801 24.576MHz
R836 1M
R831 0Ω
C818 0.01
C819 0.1
R833 56
R834 56
R832 5.1k
C820 270p
R835 56
R836 56
L804 NQR0276-001X
IC801 TSB13LV11PBM
DVC BUS IF
DVC SYSTEM DATA BUFFER
LINK CTL
LINK CORE
PHYSICAL
CN801
GND
TPB-
TPB+
TPA-
TPA+
GND
To 3 9 AU JUNK CN801 Page 4-38
1 0 DV MAIN(D I/F)

Block Name	Page
DV CPU	4-43
MSD CPU	4-44
EQ DA	4-45
DIGI IF	4-46
AUD AD/DA	4-47
CAS	4-48
DV I/O	4-49

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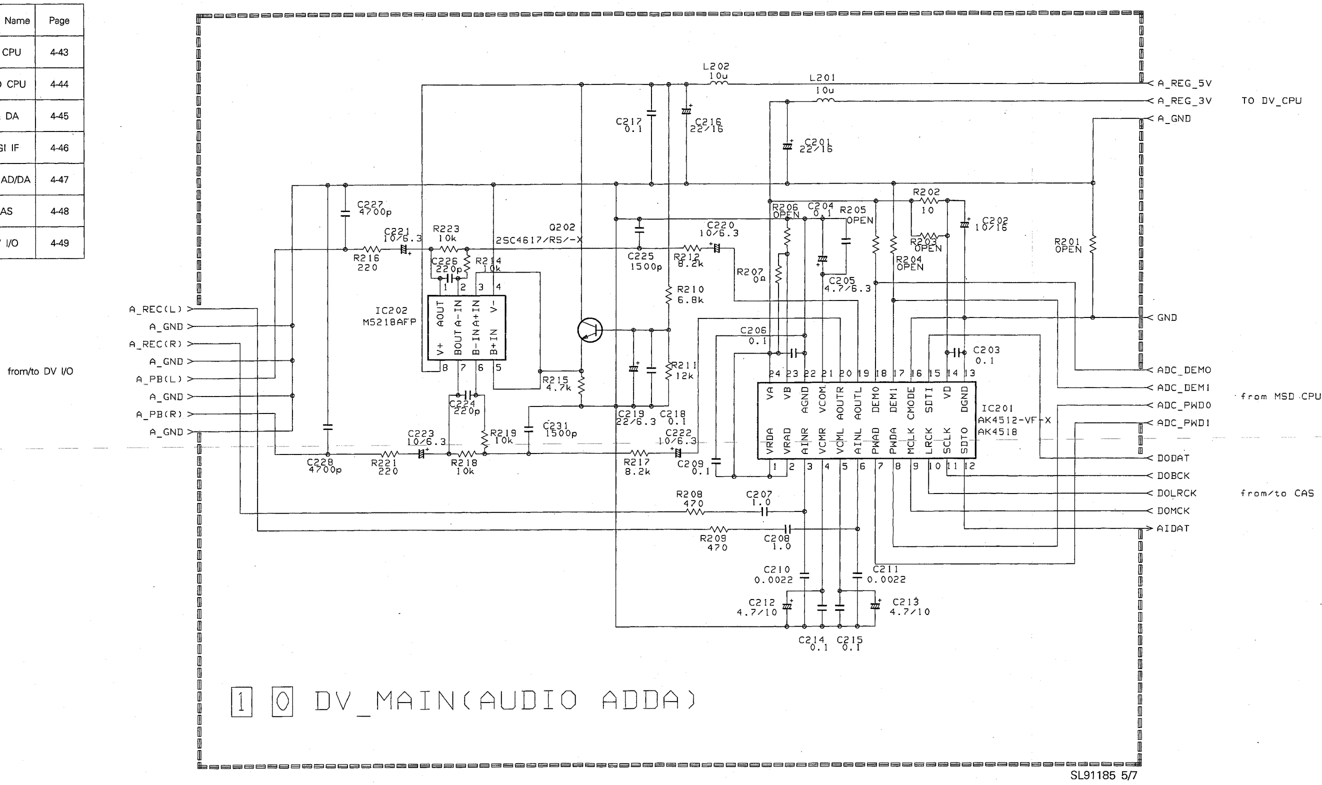
• DV MAIN SCHEMATIC DIAGRAM (5/7) 1 0

– AUD AD/DA –

Block Name	Page
DV CPU	4-43
MSD CPU	4-44
EQ DA	4-45
DIGI IF	4-46
AUD AD/DA	4-47
CAS	4-48
DV I/O	4-49

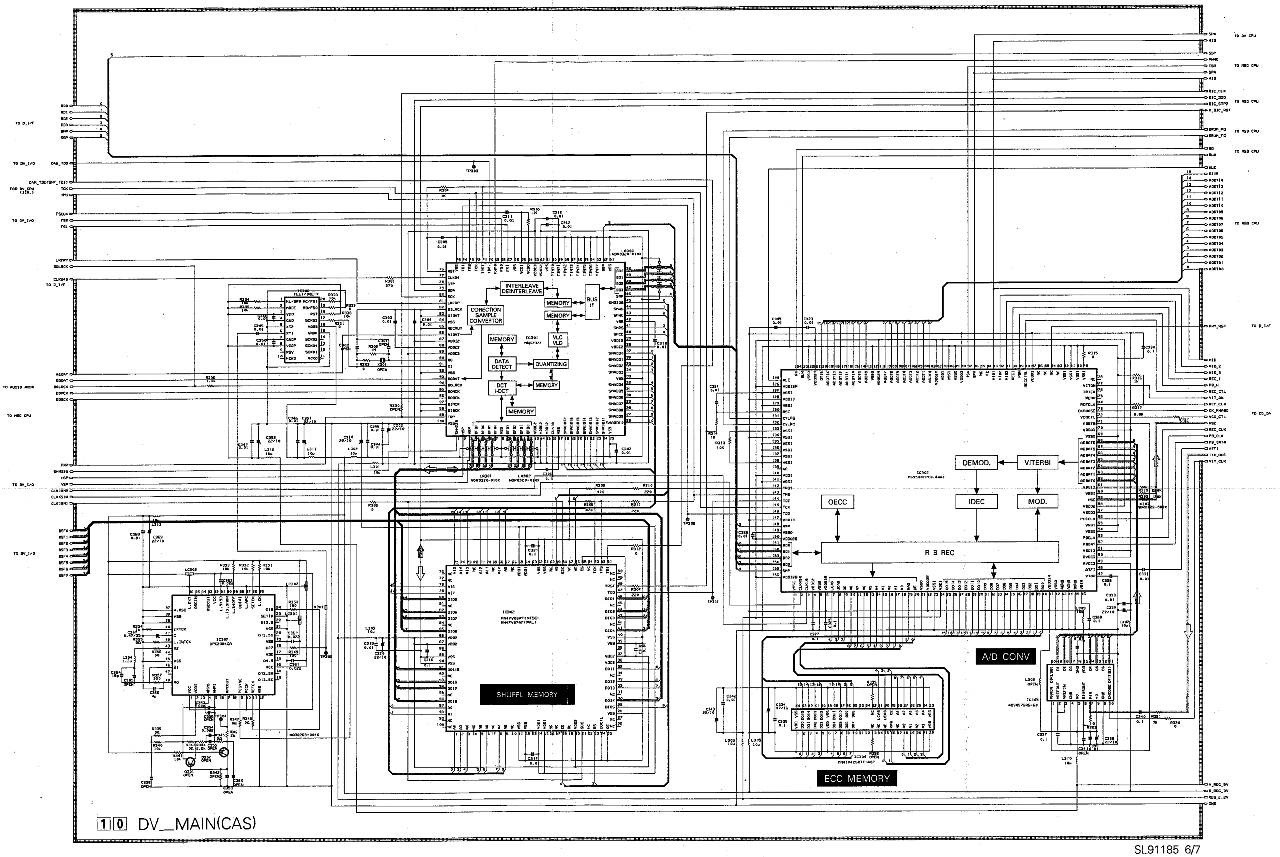


A_REG_5V
A_REG_3V
TO DV_CPU
A_GND
GND
ADC_DEMO
ADC_DEM1
ADC_PWDO
ADC_PWD1
from MSD CPU
DODAT
DOBCK
DOLRCK
DOMCK
AIDAT
from/to CAS
A_REC(L)
A_GND
A_REC(R)
A_GND
A_PB(L)
A_GND
A_PB(R)
A_GND
from/to DV I/O
L202 10u
L201 10u
C217 0.1
C216 22/16
C201 22/16
R202 10
C202 10/16
R201 OPEN
R206 OPEN
C204 0.1
R205 OPEN
R203 OPEN
R204 OPEN
R207 0Ω
C205 4.7/6.3
C220 10/6.3
R212 8.2k
R210 6.8k
C225 1500p
Q202 2SC4617/RS/-X
C227 4700p
C221 10/6.3
R223 10k
R216 220
C226 220p
R214 10k
IC202 M5218AFP
AOUT
A-IN
A+IN
V-
V+
BOUT
B-IN
B+IN
C224 220p
R215 4.7k
R211 12k
C219 22/6.3
C218 0.1
C222 10/6.3
C231 1500p
R219 10k
C223 10/6.3
R218 10k
R221 220
C228 4700p
R217 8.2k
C209 0.1
C206 0.1
C203 0.1
IC201 AK4512-VF-X AK4518
VA VB AGND VCOM AOUTR AOUTL DEMO DEM1 CMODE SDTI VD DGND
VRDA VRAD AINR VCMR VCML AINL PWAD PWDA MCLK LRCK SCLK SDTO
R208 470
C207 1.0
R209 470
C208 1.0
C210 0.0022
C211 0.0022
C212 4.7/10
C213 4.7/10
C214 0.1
C215 0.1
1 0 DV_MAIN(AUDIO ADDA)
SL91185 5/7

· DV MAIN SCHEMATIC DIAGRAM (6/7) 1 0

— CAS(Compress Audio Shuffling) —

Block Name	Page
DV CPU	4-43
MSD CPU	4-44
EQ DA	4-45
DIGI IF	4-46
AUD AD/DA	4-47
CAS	4-48
DV I/O	4-49


INTERLEAVE DEINTERLEAVE
CORECTION SAMPLE CONVERTOR
MEMORY
BUS I/F
MEMORY
MEMORY
VLC VLD
IC301 MN67373
DATA DETECT
QUANTIZING
DCT I-DCT
MEMORY
MEMORY
SHUFFL MEMORY
DEMOD.
VITERBI
OECC
IDEC
MOD.
R B REC
A/D CONV
ECC MEMORY
TO DV CPU
TO MSD CPU
TO D_I/F
TO DV_I/O
TO AUDIO ADDA
TO EQ_DA
1 0 DV_MAIN(CAS)

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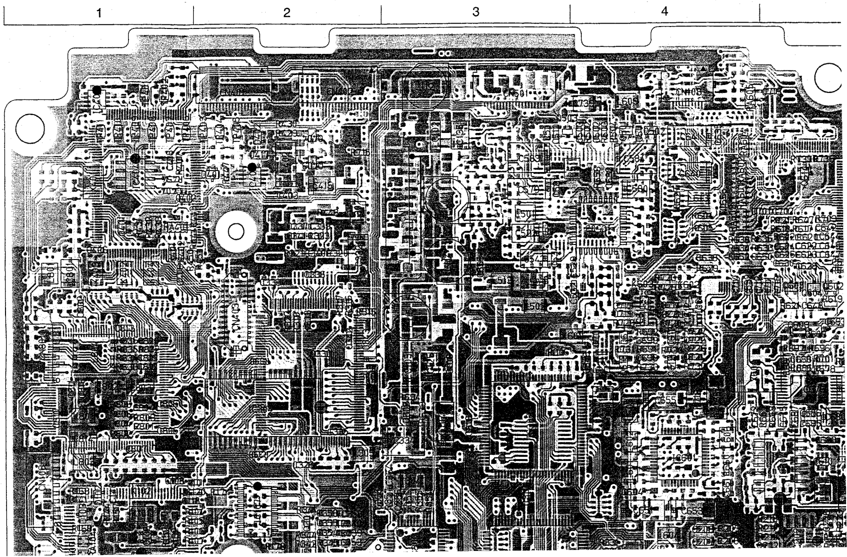
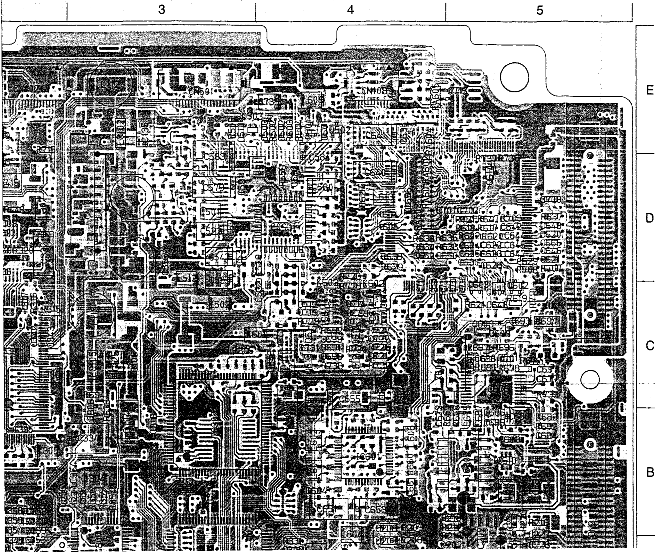
· DV MAIN CIRCUIT BOARD (FOR SERIAL No.××××0332 AND AFTER OF GY-DV500U, ××××0545 AND AFTER OF GY-DV500E)

– SIDE A –



×0332 AND AFTER OF GY-DV500U, ××××0545 AND AFTER OF GY-DV500E)

– SIDE A –



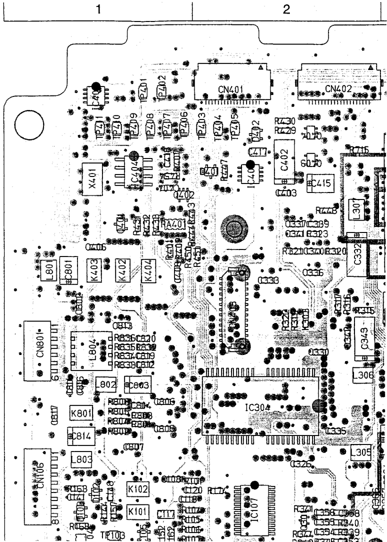
● ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interv

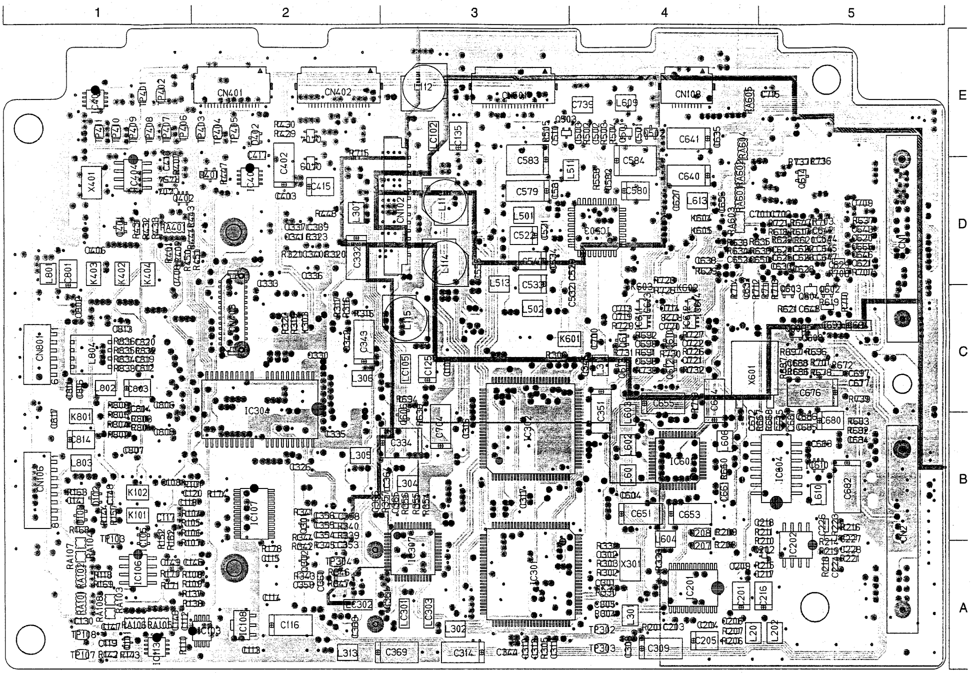
A-1C
Side — Y axis
X axis

IC101	B-1B	D402	A-2E	R221	A-5B	R420	B-1E
IC103	A-2B	D601	B-5D	R223	A-5C	R421	B-2D
IC105	A-1B			R301	B-3B	R422	B-2D
IC106	A-1B	R101	A-1C	R302	A-4B	R423	B-2D
IC107	A-2C	R103	B-2B	R303	A-4B	R424	B-2D
IC108	A-2B	R104	A-1C	R304	A-4B	R425	B-1E
IC113	A-1B	R105	A-1C	R305	A-3B	R426	B-1E
IC201	A-4B	R106	A-1B	R306	A-3D	R427	B-1E
IC202	A-5B	R107	A-1B	R307	B-4C	R428	B-1E
IC301	A-3B	R108	A-1B	R308	B-3C	R429	A-2E
IC302	A-3C	R109	A-1B	R309	B-3C	R430	A-2E
IC303	B-2C	R110	A-1B	R310	B-3C	R431	A-1D
IC304	A-2C	R111	B-1B	R311	B-3C	R432	A-1D
IC305	B-2D	R112	B-1B	R312	B-3C	R433	A-1D
IC306	B-3C	R113	B-1B	R313	B-2C	R434	B-2E
IC307	A-3B	R114	B-1B	R314	B-2C	R435	B-1E
IC401	B-1E	R115	B-1B	R315	A-2D	R436	B-1E
IC402	A-1E	R116	B-1B	R316	A-2D	R437	B-1E

C302	A-4B	C409	B-1E	C609	B-4C	C688	A-5D	L309	B-2D	CN1	A-5D
C303	B-3B	C410	B-1E	C610	B-4C	C689	B-4C	L310	B-2E	CN2	A-5B
C304	B-3B	C411	B-2E	C611	B-4C	C690	B-4D	L311	A-4C	CN102	A-3D
C305	A-4B	C412	B-2E	C612	B-4C	C691	B-4D	L312	B-3C	CN104	B-2B
C306	B-3C	C413	B-2E	C613	B-4C	C692	B-4D	L313	A-2B	CN106	A-1C
C307	B-3B	C414	B-2E	C614	B-4C	C693	A-5D	L401	B-2E	CN108	A-4E
C308	A-4B	C415	A-2E	C615	B-4C	C694	A-5D	L501	A-3D	CN401	A-2E
C309	A-4B	C416	B-1D	C617	B-5E	C695	B-5C	L502	A-3D	CN402	A-2E
C310	B-3B	C417	A-2E	C619	B-5E	C696	A-4D	L511	A-3E	CN403	A-2D
C311	A-3B	C418	A-1E	C620	A-5D	C697	A-5C	L513	A-3D	CN501	A-3E
C312	A-3B	C419	B-1D	C621	A-5D	C698	B-5C	L601	A-4C	CN801	A-1D
C313	A-3B	C501	A-4E	C622	A-5D	C699	A-4D	L602	A-4C		
C314	A-3B	C502	A-4E	C623	A-5D	C700	A-4D	L603	A-4C	LA301	B-3B
C316	A-3C	C503	A-3E	C624	A-4D	C701	A-4D	L604	A-4B	LA302	B-4C
C317	A-3C	C505	B-4E	C625	A-4D	C702	A-4D	L605	B-4C	LA303	B-3B
C318	B-4C	C506	B-4E	C626	B-5D	C704	A-3C	L606	A-4C	LA401	B-1D
C319	B-3C	C507	B-4E	C627	A-4E	C706	B-5C	L608	B-5D	LA402	B-1D

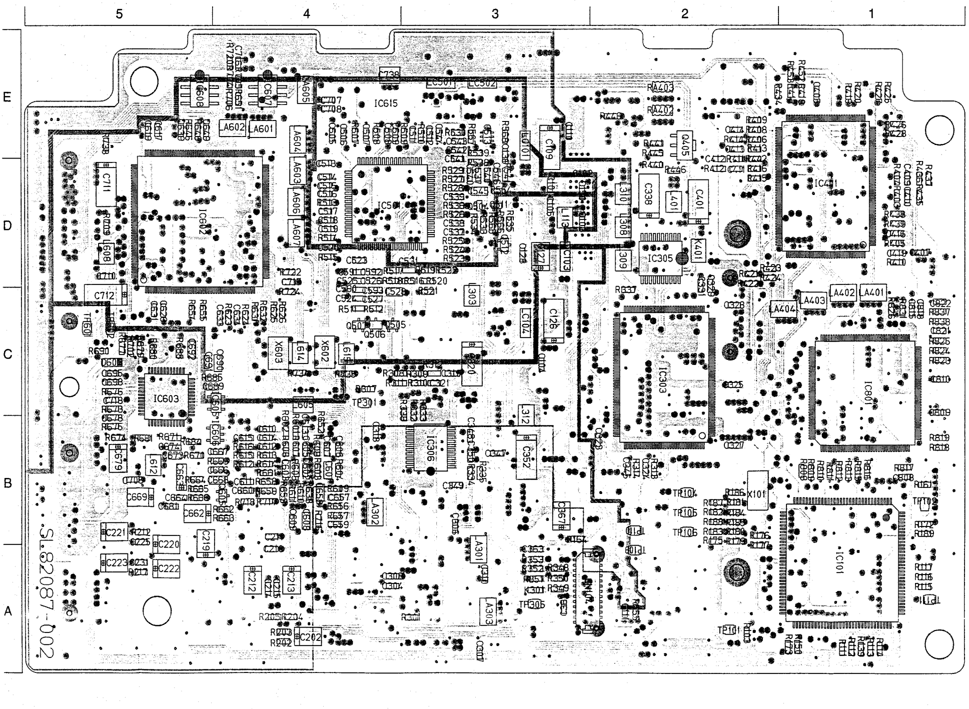

1
2
CN401
CN402
IC40
TP401
TP402
TP403
TP404
TP405
TP406
TP407
TP408
TP409
TP410
TP411
X401
IC404
C402
C415
C417
D402
R447
IC40
RA401
R431
R432
R438
R401
R402
R450
R451
R443
R444
Q401
Q406
Q408
Q403
L801
C801
K403
K402
K404
L307
C332
C343
L306
L305
IC304
CN801
L804
L802
C803
K801
C814
L803
CN106
K102
K101
IC107
C117
C148
R157
R158
TP103
R171
C120
C326
C335
R322
R319
K303
R315
R316
R317
C330
C336
C333
R321
R320
C337
C339
C341
R323
R448
R715
R429
R430
C403

– INNER PATTERN (SIDE A) –



1
2
3
4
5
A
B
C
D
E
CN401
CN402
CN108
CN801
CN106
IC304
IC107
IC302
IC301
IC307
IC601
IC604
IC201
IC202
IC106
X401
X601
X301

– INNER PATTERN (SIDE B) –



5
4
3
2
1
A
B
C
D
E
IC615
IC602
IC501
IC603
IC306
IC303
IC305
IC401
IC801
IC101
X602
X603
X101
SL82087-002

C227	A-5B	C405	B-1E	C605	B-4C	C684	A-5C	L305	A-2C	K604	A-4D
C228	A-5B	C406	A-1D	C606	B-4C	C685	A-5C	L306	A-2C	K605	A-4D
C231	B-5B	C407	B-1D	C607	B-4C	C686	A-5C	L307	A-2D	K801	A-1C
C301	A-4B	C408	A-1D	C608	B-4C	C687	A-5C	L308	B-2D		
C302	A-4B	C409	B-1E	C609	B-4C	C688	A-5D	L309	B-2D	CN1	A-5D
C303	B-3B	C410	B-1E	C610	B-4C	C689	B-4C	L310	B-2E	CN2	A-5B
C304	B-3B	C411	B-2E	C611	B-4C	C690	B-4D	L311	A-4C	CN102	A-3D
C305	A-4B	C412	B-2E	C612	B-4C	C691	B-4D	L312	B-3C	CN104	B-2B
C306	B-3C	C413	B-2E	C613	B-4C	C692	B-4D	L313	A-2B	CN106	A-1C
C307	B-3B	C414	B-2E	C614	B-4C	C693	A-5D	L401	B-2E	CN108	A-4E
C308	A-4B	C415	A-2E	C615	B-4C	C694	A-5D	L501	A-3D	CN401	A-2E
C309	A-4B	C416	B-1D	C617	B-5E	C695	B-5C	L502	A-3D	CN402	A-2E
C310	B-3B	C417	A-2E	C619	B-5E	C696	A-4D	L511	A-3E	CN403	A-2D
C311	A-3B	C418	A-1E	C620	A-5D	C697	A-5C	L513	A-3D	CN501	A-3E
C312	A-3B	C419	B-1D	C621	A-5D	C698	B-5C	L601	A-4C	CN801	A-1D
C313	A-3B	C501	A-4E	C622	A-5D	C699	A-4D	L602	A-4C		
C314	A-3B	C502	A-4E	C623	A-5D	C700	A-4D	L603	A-4C	LA301	B-3B
C316	A-3C	C503	A-3E	C624	A-4D	C701	A-4D	L604	A-4B	LA302	B-4C
C317	A-3C	C505	B-4E	C625	A-4D	C702	A-4D	L605	B-4C	LA303	B-3B
C318	B-4C	C506	B-4E	C626	B-5D	C704	A-3C	L606	A-4C	LA401	B-1D
C319	B-3C	C507	B-4E	C627	A-4E	C706	B-5C	L608	B-5D	LA402	B-1D
C320	B-3D	C508	B-3E	C628	A-5D	C707	B-4E	L609	A-4E	LA403	B-1D
C321	B-3C	C509	B-3E	C629	A-5D	C708	B-4E	L610	A-5C	LA404	B-1D
C323	B-2C	C510	A-3E	C630	A-4D	C709	A-5E	L612	B-5C	LA601	B-4E
C324	B-2C	C511	B-3E	C631	B-5D	C710	B-5D	L613	A-4E	LA602	B-4E
C325	B-2C	C512	B-3E	C632	A-4D	C711	B-5E	L614	B-4D	LA603	B-4E
C326	A-2C	C513	B-4E	C633	B-4D	C712	B-5D	L615	B-4D	LA604	B-4E
C327	B-2C	C514	B-4E	C634	B-4D	C713	A-4D	L801	A-1D	LA605	B-4E
C328	B-2D	C515	B-4E	C635	A-4E	C714	A-4D	L802	A-1C	LA606	B-4E
C329	B-2D	C516	B-4E	C638	A-4D	C715	A-4E	L803	A-1C	LA607	B-4D
C330	A-2D	C517	B-4D	C639	B-5E	C716	B-4E	L804	A-1D		
C331	B-2D	C518	B-4D	C640	A-4E	C717	B-4D			RA101	A-1B
C332	A-2D	C519	B-4D	C641	A-4E	C718	B-5C	TP101	B-2B	RA102	A-1B
C333	A-2D	C520	B-4D	C642	A-5D	C719	A-4D	TP102	B-1C	RA103	A-1B
C334	A-3C	C521	A-3D	C643	A-5D	C720	A-4D	TP103	A-1B	RA104	A-1B
C335	A-2C	C522	A-3D	C644	A-5D	C721	A-4D	TP104	B-2C	RA105	A-1B
C336	A-2D	C523	B-4D	C645	A-5D	C722	A-4D	TP105	B-2C	RA106	A-1B
C337	A-2D	C524	B-4D	C646	A-5D	C738	B-3E	TP106	B-2B	RA107	A-1B
C338	B-2E	C525	B-4D	C647	A-5D	C739	A-3E	TP107	A-1B	RA108	A-1B
C339	A-2D	C526	B-4D	C648	A-5D	C801	A-1D	TP108	A-1B	RA401	A-1D
C340	A-2D	C527	B-4D	C649	B-4E	C802	A-1D	TP109	B-2B	RA402	B-2E
C341	A-2D	C528	B-3D	C650	A-4D	C803	A-1C	TP110	B-2B	RA403	B-2E
C342	A-2D	C529	A-3D	C651	A-4C	C804	A-1C	TP111	B-1B	RA601	A-4E
C343	A-2D	C531	B-3D	C652	A-4D	C805	A-1C	TP301	B-4C	RA602	A-4E
C344	A-3B	C532	A-3D	C653	A-4C	C806	A-1C	TP302	A-4B	RA603	A-4D
C345	B-2C	C533	A-3D	C654	A-4C	C807	A-1C	TP303	A-4B	RA604	A-4E
C346	A-4C	C534	A-3D	C655	A-4C	C808	B-1C	TP304	A-2B	RA605	A-4E
C347	B-3C	C537	B-3D	C656	A-4E	C809	B-1C	TP305	B-3B		
C348	B-3C	C538	B-3D	C657	B-4C	C810	B-1C	TP401	A-1E	X101	B-2C
C349	B-3C	C539	B-3E	C658	B-4C	C811	A-1C	TP402	A-1E	X301	A-4B
C350	B-3C	C540	B-3E	C659	B-4C	C812	A-1C	TP403	A-2E	X401	A-1E
C351	A-4C	C541	B-3E	C660	B-4C	C813	A-1D	TP404	A-2E	X601	A-4C
C352	B-3C	C542	B-3E	C661	A-4C	C814	A-1C	TP405	A-2E	X602	B-4D
C353	A-2B	C543	B-3E	C662	B-4C	C815	B-1D	TP406	A-1E	X603	B-4D
C354	A-2B	C544	B-3E	C663	B-5C	C816	A-1C	TP407	A-1E	X801	B-1D
C355	A-2C	C545	B-3E	C664	B-5C	C817	A-1C	TP408	A-1E		
C356	A-2C	C546	B-3E	C665	A-5D	C818	B-1D	TP409	A-1E	LC101	B-3E
C358	A-2C	C547	A-3D	C666	B-4C	C819	A-1D	TP410	A-1E	LC102	A-3E
C359	A-2B	C555	A-3D	C667	B-4C	C820	A-1D	TP411	A-1E	LC103	B-3D
C360	A-2B	C579	A-3E	C668	B-4C	C821	B-1D	TP601	B-5D	LC104	B-3D
C361	A-2B	C580	A-4E	C669	B-5C	C822	B-1D	TP602	B-5D	LC105	A-3C
C362	B-3B	C581	A-3E	C672	A-4C					LC301	A-3B
C363	B-3B	C582	A-4E	C673	B-5C	L111	A-3E	K101	A-1C	LC302	A-2B
C364	A-2C	C583	A-3E	C674	B-5C	L112	A-3E	K102	A-1C	LC303	A-3B
C365	A-3C	C584	A-4E	C675	A-4C	L113	B-3D	K301	B-3B	LC501	B-3E
C366	A-2C	C590	B-4D	C676	A-5C	L114	A-3D	K303	A-2D	LC502	B-3E
C367	B-3C	C591	B-4D	C677	A-5C	L115	A-3D	K401	B-2D		
C368	A-2B	C592	B-4D	C678	B-5C	L201	A-4B	K402	A-1D		
C369	A-3B	C593	B-4D	C679	B-5C	L202	A-4B	K403	A-1D		
C401	B-2E	C601	B-4C	C680	A-5C	L301	A-4B	K404	A-1D		
C402	A-2E	C602	B-4C	C681	B-5C	L302	A-3B	K601	A-3D		
C403	A-2E	C603	B-4C	C682	A-5C	L303	B-3D	K602	A-4D		
C404	A-1E	C604	A-4C	C683	A-5C	L304	A-3C	K603	A-4D		

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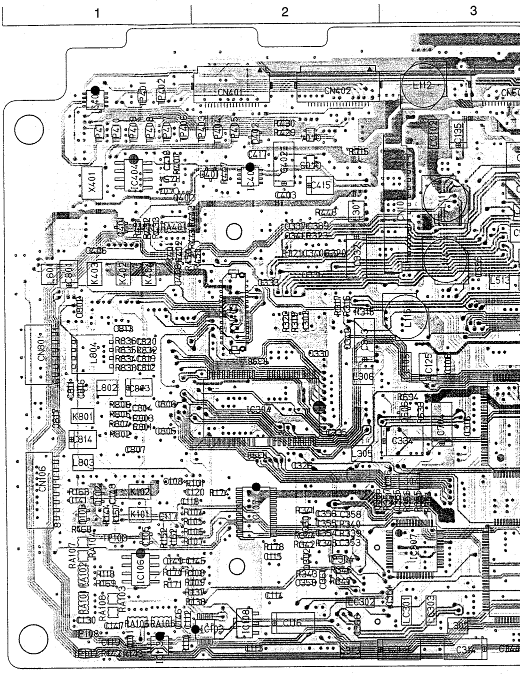

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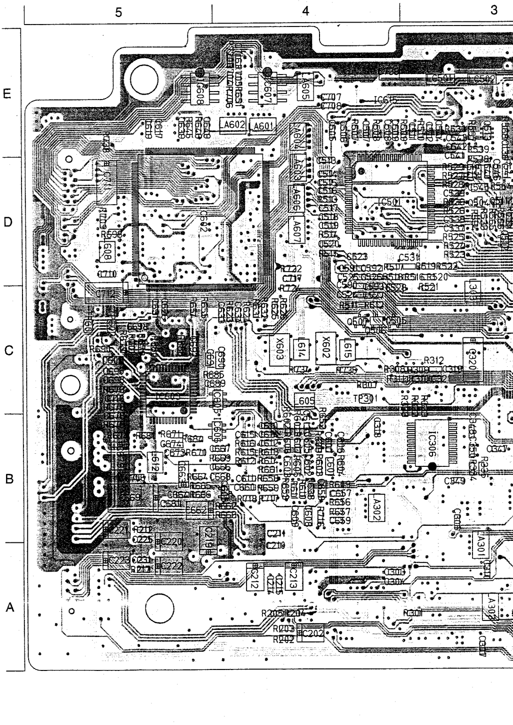
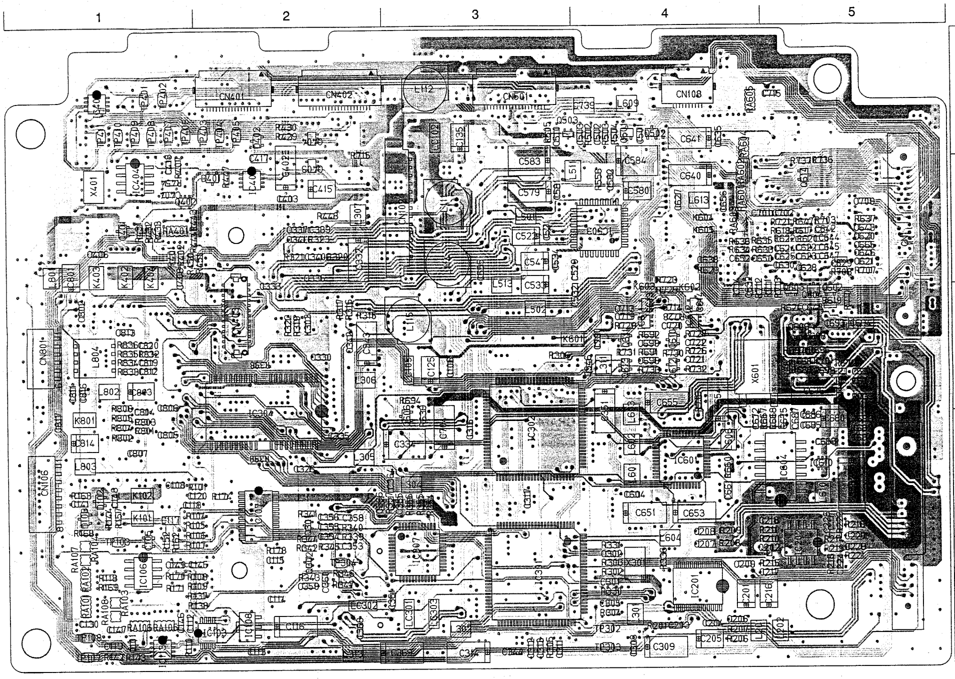
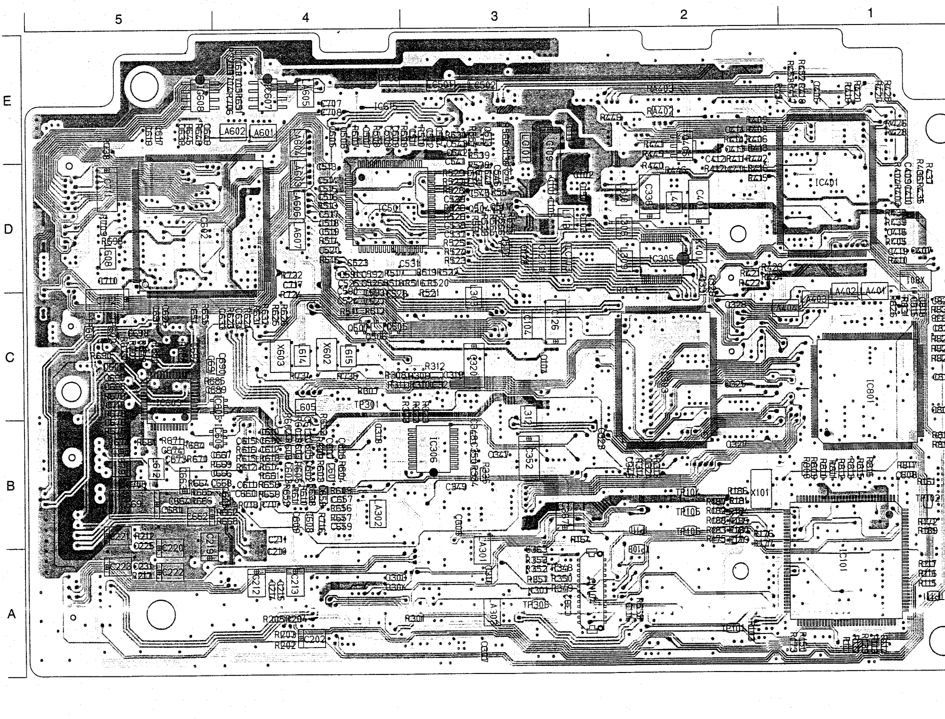


5	A-2C	K604	A-4D
6	A-2C	K605	A-4D
7	A-2D	K801	A-1C
8	B-2D		
9	B-2D	CN1	A-5D
0	B-2E	CN2	A-5B
1	A-4C	CN102	A-3D
2	B-3C	CN104	B-2B
3	A-2B	CN106	A-1C
01	B-2E	CN108	A-4E
01	A-3D	CN401	A-2E
02	A-3D	CN402	A-2E
1	A-3E	CN403	A-2D
3	A-3D	CN501	A-3E
01	A-4C	CN801	A-1D
02	A-4C		
03	A-4C	LA301	B-3B
04	A-4B	LA302	B-4C
05	B-4C	LA303	B-3B
06	A-4C	LA401	B-1D
08	B-5D	LA402	B-1D
09	A-4E	LA403	B-1D
10	A-5C	LA404	B-1D
12	B-5C	LA601	B-4E
13	A-4E	LA602	B-4E
14	B-4D	LA603	B-4E
15	B-4D	LA604	B-4E
01	A-1D	LA605	B-4E
02	A-1C	LA606	B-4E
03	A-1C	LA607	B-4D
04	A-1D		
		RA101	A-1B
101	B-2B	RA102	A-1B
102	B-1C	RA103	A-1B
103	A-1B	RA104	A-1B
104	B-2C	RA105	A-1B
105	B-2C	RA106	A-1B
106	B-2B	RA107	A-1B
107	A-1B	RA108	A-1B
P108	A-1B	RA401	A-1D
P109	B-2B	RA402	B-2E
P110	B-2B	RA403	B-2E
P111	B-1B	RA601	A-4E
P301	B-4C	RA602	A-4E
P302	A-4B	RA603	A-4D
P303	A-4B	RA604	A-4E
P304	A-2B	RA605	A-4E
P305	B-3B		
P401	A-1E	X101	B-2C
P402	A-1E	X301	A-4B
P403	A-2E	X401	A-1E
P404	A-2E	X601	A-4C
P405	A-2E	X602	B-4D
P406	A-1E	X603	B-4D
P407	A-1E	X801	B-1D
P408	A-1E		
P409	A-1E	LC101	B-3E
P410	A-1E	LC102	A-3E
P411	A-1E	LC103	B-3D
P601	B-5D	LC104	B-3D
P602	B-5D	LC105	A-3C
		LC301	A-3B
101	A-1C	LC302	A-2B
102	A-1C	LC303	A-3B
301	B-3B	LC501	B-3E
303	A-2D	LC502	B-3E
401	B-2D		
402	A-1D		
403	A-1D		
404	A-1D		
601	A-3D		
602	A-4D		
603	A-4D		

– INNER PATTERN (SIDE A) –

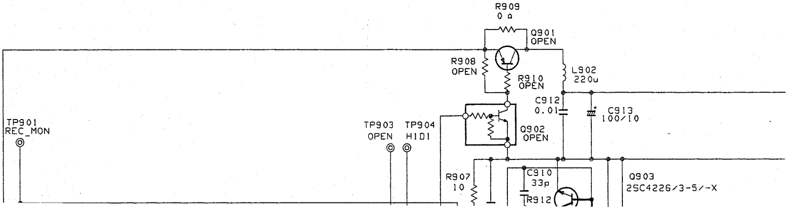

1
2
3
4
5
CN401
CN402
CN501
CN108
CN801
CN106
IC302
IC307
IC201
IC601
IC604
X401
X601
K801
L802
L803
L804

– INNER PATTERN (SIDE B) –

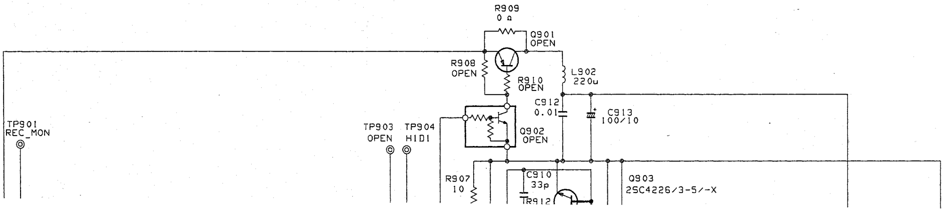

5
4
3
2
1
E
D
C
B
A
IC401
IC305
IC306
IC501
IC801
IC101
IC603
X101
X602
X603
A302
A601
A602

4.33 PR & MDA SCHEMATIC DIAGRAM (1/2) $\boxed{0}\boxed{1}$

– PR –

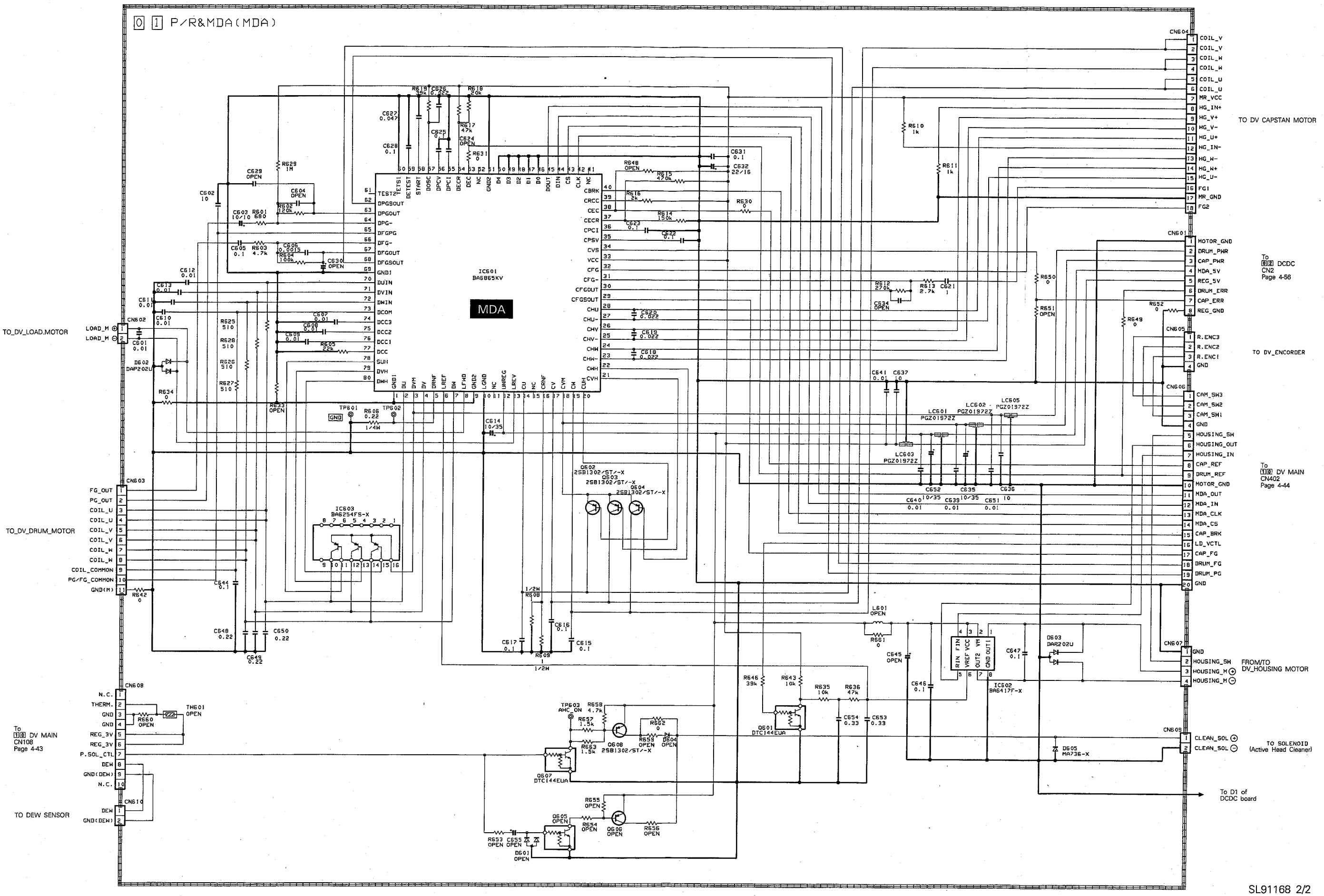

R909
0 Ω
Q901
OPEN
R908
OPEN
R910
OPEN
L902
220u
C912
0.01
C913
100/10
TP901
REC_MON
TP903
OPEN
TP904
HID1
Q902
OPEN
R907
10
C910
33p
R912
Q903
2SC4226/3-5/-X

GRAM (1/2) 01


R909
0 Ω
Q901
OPEN
R908
OPEN
R910
OPEN
L902
220u
C912
0.01
C913
100/10
TP901
REC_MON
TP903
OPEN
TP904
HID1
Q902
OPEN
R907
10
C910
33p
TR912
Q903
2SC4226/3-5/-X

• PR(Pre Rec) & MDA(Motor Drive Amp.) SCHEMATIC DIAGRAM (2/2) 01

— MDA —

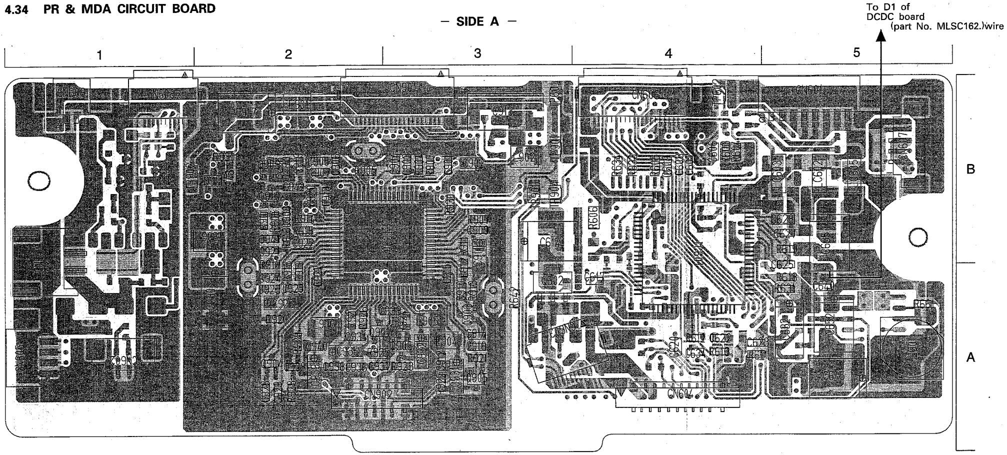


0 1 P/R&MDA(MDA)
IC601
BA6865KV
MDA
TEST2
DPGSOUT
DPGOUT
DPG-
DFGPG
DFG-
DFGOUT
DFGSOUT
GND1
DUIN
DVIN
DWIN
DCOM
DCC3
DCC2
DCC1
DCC
SUH
DVH
DWH
TEST1
DETEST
START
DOSC
DPCV
DPCI
DECR
DEC
NC
GND2
D4
D3
D2
D1
D0
DOUT
DIN
CS
CLK
CBRK
CRCC
CEC
CECR
CPCI
CPSV
CVS
VCC
CFG
CFG-
CFGOUT
CFGSOUT
CHU
CHU-
CHV
CHV-
CHW
CHW-
CWH
CVH
DU
DVM
DV
DRNF
LREF
DW
LFWD
LGND
UNREG
LREV
CU
CRNF
CV
CVM
CW
CUH
CN604
COIL_V
COIL_V
COIL_W
COIL_W
COIL_U
COIL_U
MR_VCC
HG_IN+
HG_V+
HG_V-
HG_U+
HG_IN-
HG_W-
HG_W+
HG_U-
FG1
MR_GND
FG2
TO DV CAPSTAN MOTOR
CN601
MOTOR_GND
DRUM_PWR
CAP_PWR
MDA_5V
REG_5V
DRUM_ERR
CAP_ERR
REG_GND
To
02 DCDC
CN2
Page 4-56
CN605
R.ENC3
R.ENC2
R.ENC1
GND
TO DV_ENCORDER
CN606
CAM_SW3
CAM_SW2
CAM_SW1
GND
HOUSING_SW
HOUSING_OUT
HOUSING_IN
CAP_REF
DRUM_REF
MOTOR_GND
MDA_OUT
MDA_IN
MDA_CLK
MDA_CS
CAP_BRK
LD_VCTL
CAP_FG
DRUM_FG
DRUM_PG
GND
To
10 DV MAIN
CN402
Page 4-44
CN607
GND
HOUSING_SW
HOUSING_M ⊕
HOUSING_M ⊖
FROM/TO
DV_HOUSING MOTOR
CN609
CLEAN_SOL ⊕
CLEAN_SOL ⊖
TO SOLENOID
(Active Head Cleaner)
To D1 of
DCDC board
TO_DV_LOAD.MOTOR
CN602
LOAD_M ⊕
LOAD_M ⊖
C601
0.01
D602
DAP202U
R634
0
CN603
FG_OUT
PG_OUT
COIL_U
COIL_U
COIL_V
COIL_V
COIL_W
COIL_W
COIL_COMMON
PG/FG_COMMON
GND(M)
TO_DV_DRUM_MOTOR
R642
0
CN608
N.C.
THERM.
GND
GND
REG_3V
REG_3V
P.SOL_CTL
DEW
GND(DEW)
N.C.
To
10 DV MAIN
CN108
Page 4-43
CN610
DEW
GND(DEW)
TO DEW SENSOR
TH601
OPEN
R660
OPEN
IC603
BA6254FS-X
IC602
BA6417F-X
RIN
FIN
VREF
VCC
OUT2
VM
GND
OUT1
Q602
2SB1302/ST/-X
Q603
2SB1302/ST/-X
Q604
2SB1302/ST/-X
Q601
DTC144EUA
Q607
DTC144EUA
Q608
2SB1302/ST/-X
Q605
OPEN
Q606
OPEN
D603
DAP202U
D604
OPEN
D605
MA736-X
D601
OPEN
TP601
TP602
TP603
AHC_ON
GND
LC601
PGZ01972Z
LC602
PGZ01972Z
LC603
PGZ01972Z
LC605
PGZ01972Z
L601
OPEN
R619 39k
C626 0.022
R618 20k
C627 0.047
C625 0
R617 47k
C624 OPEN
C628 0.1
R631 0
R629 1M
C629 OPEN
C604 OPEN
C602 10
R602 120k
C603 10/10
R601 680
C605 0.1
R603 4.7k
C606 0.0015
R604 100k
C630 OPEN
C612 0.01
C613 0.01
C611 0.01
C610 0.01
C607 0.01
C608 0.01
C609 0.01
R605 22k
R625 510
R628 510
R626 510
R627 510
R633 OPEN
R606 0.22 1/4W
C614 10/35
C631 0.1
C632 22/16
R648 OPEN
R615 470k
R616 2k
R630 0
R614 150k
C623 0.1
C622 0.1
C620 0.022
C619 0.022
C618 0.022
R610 1k
R611 1k
R650 0
R651 OPEN
R612 270k
R613 2.7k
C621 1
C634 OPEN
R652 0
R649 0
C641 0.01
C637 10
C652 10/35
C635 10/35
C636 10
C640 0.01
C639 0.01
C651 0.01
C644 0.1
C648 0.22
C649 0.22
C650 0.22
R608 1/2W
C616 0.1
C617 0.1
R609 1/2W
C615 0.1
R661 0
C645 OPEN
C647 0.1
C646 0.1
R646 39k
R643 10k
R635 10k
R636 47k
C654 0.33
C653 0.33
R658 4.7k
R657 1.5k
R662 0
R659 OPEN
R663 1.5k
R655 OPEN
R654 OPEN
R656 OPEN
R653 OPEN
C655 OPEN

SL91168 2/2

4.34 PR & MDA CIRCUIT BOARD

– SIDE A –



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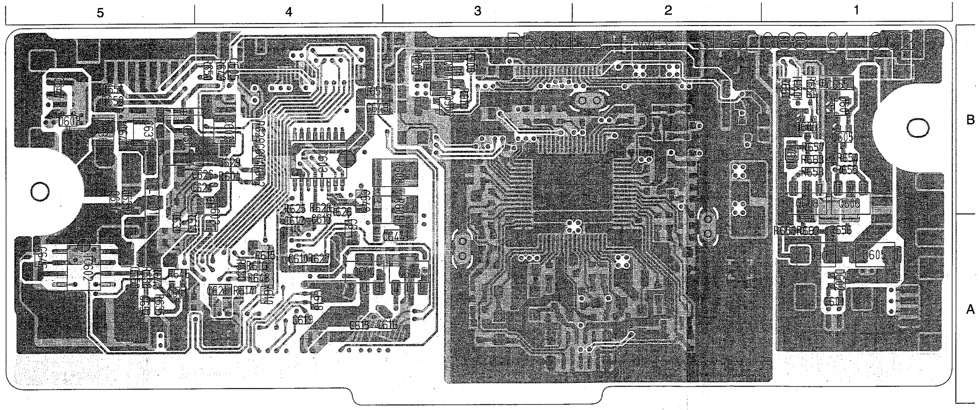


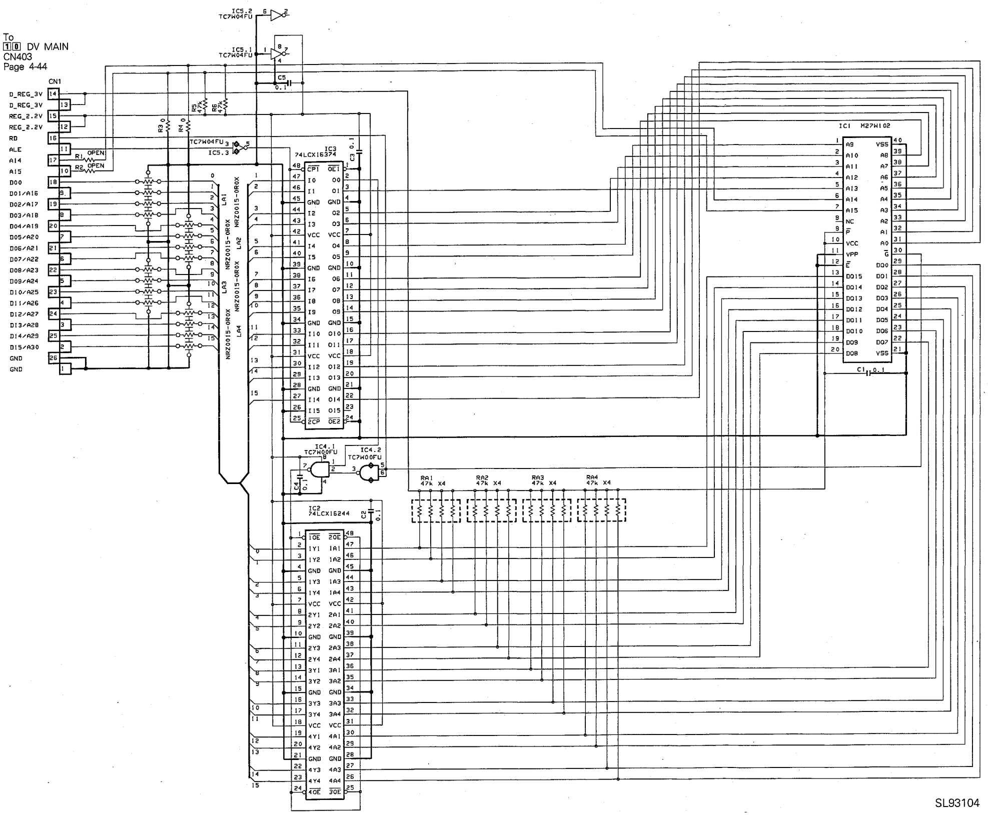
● **ADDRESS TABLE OF BOARD PARTS**
Each address may have an address error by one interval.

```
          A-1C
Side  ──┘ │ └── Y axis
          └──── X axis
```

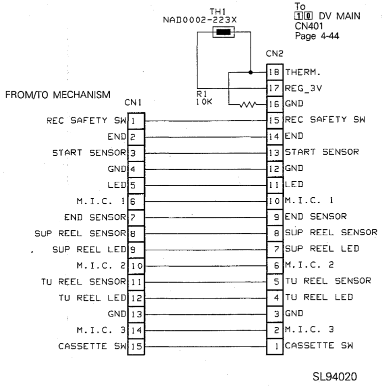
IC601	A-4B	R651	B-5B	C622	A-4A	C937	A-2A
IC602	B-5A	R652	B-5B	C623	A-4A	C938	A-2A
IC603	B-4B	R653	B-1B	C624	B-4B	C939	A-2A
IC901	A-3B	R654	B-1B	C625	A-5A	C940	A-2A
		R655	B-1B	C626	B-4B	C941	A-2B
Q601	B-5A	R656	B-1A	C627	A-5B	C942	A-2B
Q602	A-3A	R657	B-1B	C628	A-5B	C943	A-2B
Q603	B-3A	R658	B-1B	C629	B-4B		
Q604	B-4A	R659	B-1A	C630	B-5B	L601	A-5A
Q605	B-1B	R660	B-1B	C631	B-5A	L901	A-2B
Q606	B-1B	R661	A-5A	C632	A-5A	L902	A-3B
Q607	B-1B	R662	B-1A	C634	A-4A	L903	A-2B
Q608	B-1B	R663	B-1B	C635	A-5B	L904	A-3A
Q901	B-3B	R901	A-2B	C636	B-5B	L905	A-3A
Q902	B-3B	R903	A-3B	C637	B-5B	L906	A-2A
Q903	A-3A	R904	A-3B	C639	B-5B		
Q904	A-2A	R905	A-2B	C640	A-5A	TP601	A-3B
Q905	A-3A	R906	A-2B	C641	B-5B	TP602	A-4B
Q906	A-3A	R907	A-3B	C644	B-3A	TP603	B-1B
Q907	A-2A	R908	B-3B	C645	A-5A	TP901	A-3B
Q908	A-2A	R909	B-3B	C646	B-5A	TP902	A-1B
Q909	A-2B	R910	B-3B	C647	B-5B	TP903	A-3B
Q910	A-2B	R911	A-3B	C648	B-4B	TP904	A-3B
Q911	A-2B	R912	A-3A	C649	B-4B		
		R913	A-3A	C650	B-4B	TH601	B-1B
D601	B-1B	R914	A-2B	C651	B-5B		
D602	B-1A	R915	A-2B	C652	A-5A	CN601	A-5B
D603	B-5B	R916	A-2B	C653	B-5A	CN602	A-1A
D604	B-1A	R917	A-2B	C654	B-5A	CN603	A-3A
D605	B-1A	R918	A-2A	C655	B-1B	CN604	A-4A
		R919	A-2A	C901	A-3B	CN605	A-1A
R601	B-4B	R920	A-2A	C902	A-3B	CN606	A-4B
R602	B-4B	R921	A-3A	C903	A-3B	CN607	A-5B
R603	A-4B	R922	A-3A	C904	A-3B	CN608	A-1B
R604	A-4B	R923	A-3A	C905	A-2B	CN609	A-1B
R605	A-4B	R924	A-3A	C906	A-2B	CN610	A-1B
R606	A-4B	R925	A-2A	C907	A-2B	CN901	A-3B
R608	B-3B	R926	A-2A	C908	A-2B	CN902	A-2A
R609	B-3B	R927	A-2A	C909	A-3B		
R610	B-4A	R928	A-2A	C910	A-3A	LC601	B-5B
R611	A-4A	R929	A-2A	C911	A-3B	LC602	A-5B
R612	A-4A	R930	A-3B	C912	A-3A	LC603	A-5B
R613	A-4A	R931	A-2B	C913	A-3B	LC605	A-5B
R614	B-4A	R932	A-2B	C914	A-3A		
R615	B-4A			C915	A-3A		
R616	B-4A	C601	B-1A	C916	A-3A		
R617	B-5A	C602	B-4B	C917	A-2B		
R618	A-5A	C603	B-4B	C918	A-2B		
R619	A-5B	C604	B-4B	C919	A-2B		
R625	B-4B	C605	B-4B	C920	A-2B		
R626	B-4B	C606	A-4B	C921	A-2B		
R627	B-4A	C607	A-4B	C922	A-2B		
R628	B-4B	C608	A-4B	C923	A-2A		
R629	B-4B	C609	A-4B	C924	A-2A		
R630	B-4A	C610	B-4A	C925	A-2A		
R631	A-5A	C611	B-4A	C926	A-2A		
R633	A-4B	C612	B-4A	C927	A-2A		
R634	A-4B	C613	B-4A	C928	A-2A		
R635	B-5A	C614	A-3B	C929	A-2A		
R636	B-5A	C615	B-4A	C930	A-2A		
R642	A-3A	C616	B-3A	C931	A-3A		
R643	B-5A	C617	A-4A	C932	A-3A		
R646	B-5A	C618	B-4A	C933	A-3A		
R648	B-4A	C619	B-4A	C934	A-2A		
R649	B-4B	C620	A-4A	C935	A-2A		
R650	B-4B	C621	B-4A	C936	A-2A		

4.35 ROM, CONN. SCHEMATIC DIAGRAM 03/04

· ROM 03

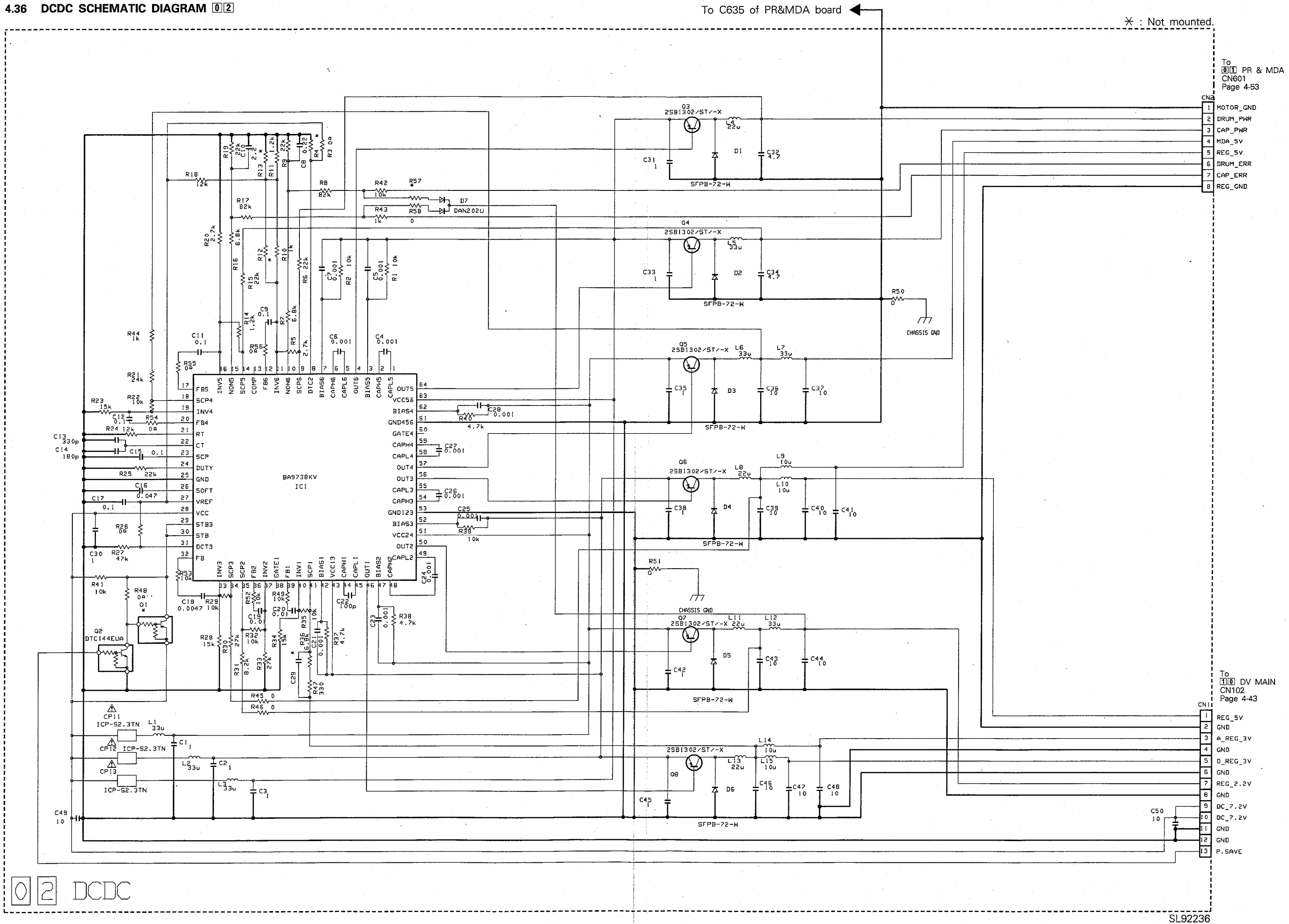

To
10 DV MAIN
CN403
Page 4-44
CN1
D_REG_3V
D_REG_3V
REG_2.2V
REG_2.2V
RD
ALE
A14
A15
D00
D01/A16
D02/A17
D03/A18
D04/A19
D05/A20
D06/A21
D07/A22
D08/A23
D09/A24
D10/A25
D11/A26
D12/A27
D13/A28
D14/A29
D15/A30
GND
GND
R1 OPEN
R2 OPEN
R3 0
R4 0
R5 47k
R6 47k
IC5.2 TC7W04FU
IC5.1 TC7W04FU
TC7W04FU IC5.3
C5 0.1
C3 0.1
LA1 NRZ0015-0R0X
LA2 NRZ0015-0R0X
LA3 NRZ0015-0R0X
LA4 NRZ0015-0R0X
IC3 74LCX16374
CP1
OE1
GND
VCC
2CP
OE2
IC1 M27W102
A9 A10 A11 A12 A13 A14 A15 NC P VCC VPP E
DQ15 DQ14 DQ13 DQ12 DQ11 DQ10 DQ9 DQ8
VSS A8 A7 A6 A5 A4 A3 A2 A1 A0 G
DQ0 DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 VSS
C1 0.1
IC4.1 TC7W00FU
IC4.2 TC7W00FU
C4 0.1
IC2 74LCX16244
C2 0.1
1OE 2OE 1Y1 1A1 1Y2 1A2 1Y3 1A3 1Y4 1A4
2Y1 2A1 2Y2 2A2 2Y3 2A3 2Y4 2A4
3Y1 3A1 3Y2 3A2 3Y3 3A3 3Y4 3A4
4Y1 4A1 4Y2 4A2 4Y3 4A3 4Y4 4A4 4OE 3OE
RA1 47k X4
RA2 47k X4
RA3 47k X4
RA4 47k X4
SL93104

· CONN. 04


TH1
NAD0002-223X
To
10 DV MAIN
CN401
Page 4-44
CN2
R1 10K
FROM/TO MECHANISM
CN1
REC SAFETY SW 1
END 2
START SENSOR 3
GND 4
LED 5
M.I.C. 1 6
END SENSOR 7
SUP REEL SENSOR 8
SUP REEL LED 9
M.I.C. 2 10
TU REEL SENSOR 11
TU REEL LED 12
GND 13
M.I.C. 3 14
CASSETTE SW 15
18 THERM.
17 REG_3V
16 GND
15 REC SAFETY SW
14 END
13 START SENSOR
12 GND
11 LED
10 M.I.C. 1
9 END SENSOR
8 SUP REEL SENSOR
7 SUP REEL LED
6 M.I.C. 2
5 TU REEL SENSOR
4 TU REEL LED
3 GND
2 M.I.C. 3
1 CASSETTE SW
SL94020

4.36 DCDC SCHEMATIC DIAGRAM 02

※ : Not mounted.

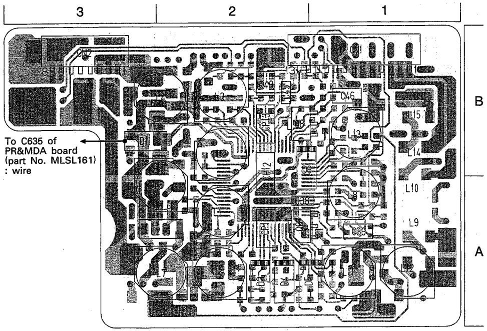

To C635 of PR&MDA board
To 01 PR & MDA CN601 Page 4-53
CN2
1 MOTOR_GND
2 DRUM_PWR
3 CAP_PWR
4 MDA_5V
5 REG_5V
6 DRUM_ERR
7 CAP_ERR
8 REG_GND
To 10 DV MAIN CN102 Page 4-43
CN1
1 REG_5V
2 GND
3 A_REG_3V
4 GND
5 D_REG_3V
6 GND
7 REG_2.2V
8 GND
9 DC_7.2V
10 DC_7.2V
11 GND
12 GND
13 P.SAVE
BA9738KV
IC1
FB5
SCP4
INV4
FB4
RT
CT
SCP
DUTY
GND
SOFT
VREF
VCC
STB3
STB
DCT3
FB
INV5
NON5
SCP5
COMP
FB6
INV6
NON6
SCP6
DTC2
BIAS6
CAPH6
CAPL6
OUT6
BIAS5
CAPH5
CAPL5
OUT5
VCC56
BIAS4
GND456
GATE4
CAPH4
CAPL4
OUT4
OUT3
CAPL3
CAPH3
GND123
BIAS3
VCC24
OUT2
CAPL2
INV3
SCP3
SCP2
FB2
INV2
GATE1
FB1
INV1
SCP1
BIAS1
VCC13
CAPH1
CAPL1
OUT1
BIAS2
CAPH2
Q3 2SB1302/ST/-X
Q4 2SB1302/ST/-X
Q5 2SB1302/ST/-X
Q6 2SB1302/ST/-X
Q7 2SB1302/ST/-X
Q8 2SB1302/ST/-X
D1 D2 D3 D4 D5 D6
SFPB-72-W
L4 22u
L5 33u
L6 33u
L7 33u
L8 22u
L9 10u
L10 10u
L11 22u
L12 33u
L13 22u
L14 10u
L15 10u
L1 33u
L2 33u
L3 33u
C31 1
C32 4.7
C33 1
C34 4.7
C35 1
C36 10
C37 10
C38 1
C39 10
C40 10
C41 10
C42 1
C43 10
C44 10
C45 1
C46 10
C47 10
C48 10
C49 10
C50 10
C1 1
C2 1
C3 1
R50 0
R51 0
CHASSIS GND
CHASSIS GND
D7 DAN202U
R42 10k
R43 1k
R57 *
R58 0
R8 82k
R17 82k
R18 12k
R19 22k
C10 2.2
R13 *
R11 1.2k
R9 22k
C8 0.22
R4 *
R3 0Ω
R20 2.7k
R16 6.8k
R12 *
R10 1k
R6 22k
C7 0.001
R2 10k
C5 0.001
R1 10k
R15 22k
R14 1.2k
C9 0.1
R7 6.8k
R56 0Ω
R5 2.7k
C6 0.001
C4 0.001
C11 0.1
R55 0Ω
R44 1k
R21 24k
R22 10k
R23 15k
C12 0.1
R54 0Ω
R24 12k
C13 330p
C14 180p
C15 0.1
R25 22k
C16 0.047
C17 0.1
R26 0Ω
R27 47k
C30 1
R53 10k
C18 0.0047
R29 10k
R41 10k
R48 0Ω
Q1 *
Q2 DTC144EUA
C28 0.001
R40 4.7k
C27 0.001
C26 0.001
C25 0.001
R39 10k
C24 0.001
R52 10k
R49 10k
C19 0.01
C20 0.01
C22 100p
C23 0.001
R38 4.7k
R28 15k
R30 27k
R32 10k
R31 8.2k
R33 27k
R34 15k
R35 10k
R36 6.8k
C21 0.001
R37 4.7k
C29 *
R47 330
R45 0
R46 0
CP11 ICP-S2.3TN
CP12 ICP-S2.3TN
CP13 ICP-S2.3TN
02 DCDC

SL92236

4.37 DCDC, ROM, CONN. CIRCUIT BOARD

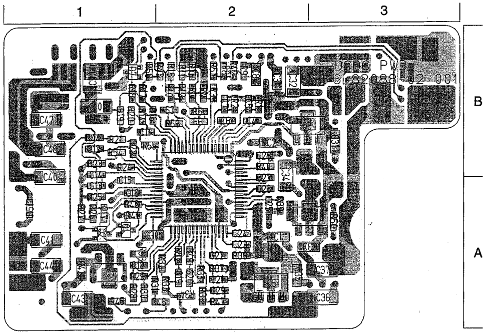
· DCDC

– SIDE A –



To C635 of PR&MDA board (part No. MLSL161) : wire

– SIDE B –



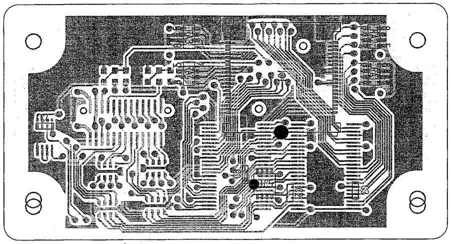
● **ADDRESS TABLE OF BOARD PARTS**
Each address may have an address error by one interval.

A-1C
Side ┘││└─ Y axis
└── X axis

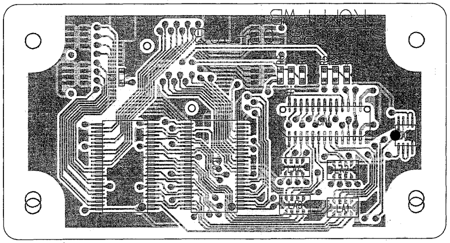
IC1	B-2A	R29	B-1A	C17	B-1A	L13	A-1B
		R30	B-1A	C18	B-1A	L14	A-1B
Q1	B-1A	R31	B-1A	C19	B-2A	L15	A-1B
Q2	B-1A	R32	B-2A	C20	B-2A		
Q3	B-3B	R33	B-2A	C21	B-2A	CP11	A-2A
Q4	B-3A	R34	B-2A	C22	B-2A	CP12	A-2B
Q5	B-2A	R35	B-2A	C23	B-2A	CP13	A-2B
Q6	A-2A	R36	B-2A	C24	B-2A		
Q7	B-1A	R37	B-2A	C25	B-2A	CN1	A-1B
Q8	A-2B	R38	B-2A	C26	B-2A	CN2	A-3B
		R39	B-2A	C27	B-2B		
D1	A-3B	R40	B-2B	C28	B-2B		
D2	A-2A	R41	B-1A	C29	B-2A		
D3	A-2A	R42	B-2B	C30	B-1A		
D4	A-2A	R43	B-2B	C31	B-3B		
D5	A-1A	R44	B-1B	C32	B-2B		
D6	A-1B	R45	B-1A	C33	B-3A		
D7	B-1B	R46	B-2A	C34	B-2B		
		R47	B-2A	C35	B-2A		
R1	B-2B	R48	B-1A	C36	B-3A		
R2	B-2B	R49	B-2A	C37	B-3A		
R3	B-2B	R50	B-3A	C38	A-2A		
R4	B-2B	R51	B-1A	C39	A-1A		
R5	B-2B	R52	B-2A	C40	B-1B		
R6	B-2B	R53	B-1A	C41	B-1A		
R7	B-2B	R54	B-1B	C42	B-1A		
R8	B-2B	R55	B-1B	C43	B-1A		
R9	B-2B	R56	B-2B	C44	B-1A		
R10	B-2B	R57	B-2B	C45	A-2B		
R11	B-2B	R58	B-1B	C46	A-1B		
R12	B-2B			C47	B-1B		
R13	B-2B	C1	B-2A	C48	B-1B		
R14	B-1B	C2	B-2B	C49	A-2B		
R15	B-1B	C3	B-2B	C50	B-1B		
R16	B-1B	C4	B-2B				
R17	B-1B	C5	B-2B	L1	A-2A		
R18	B-2B	C6	B-2B	L2	A-2B		
R19	B-1B	C7	B-2B	L3	A-2B		
R20	B-1B	C8	B-2B	L4	A-2B		
R21	B-1B	C9	B-2B	L5	A-2A		
R22	B-1B	C10	B-1B	L6	A-2A		
R23	B-1B	C11	B-1B	L7	A-2A		
R24	B-1B	C12	B-1B	L8	A-1A		
R25	B-1A	C13	B-1A	L9	A-1A		
R26	B-1A	C14	B-1B	L10	A-1A		
R27	B-1A	C15	B-1B	L11	A-1A		
R28	B-1A	C16	B-1A	L12	A-1A		

· ROM

– SIDE A –

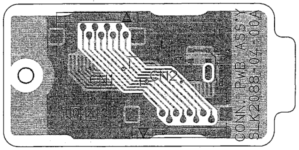


– SIDE B –



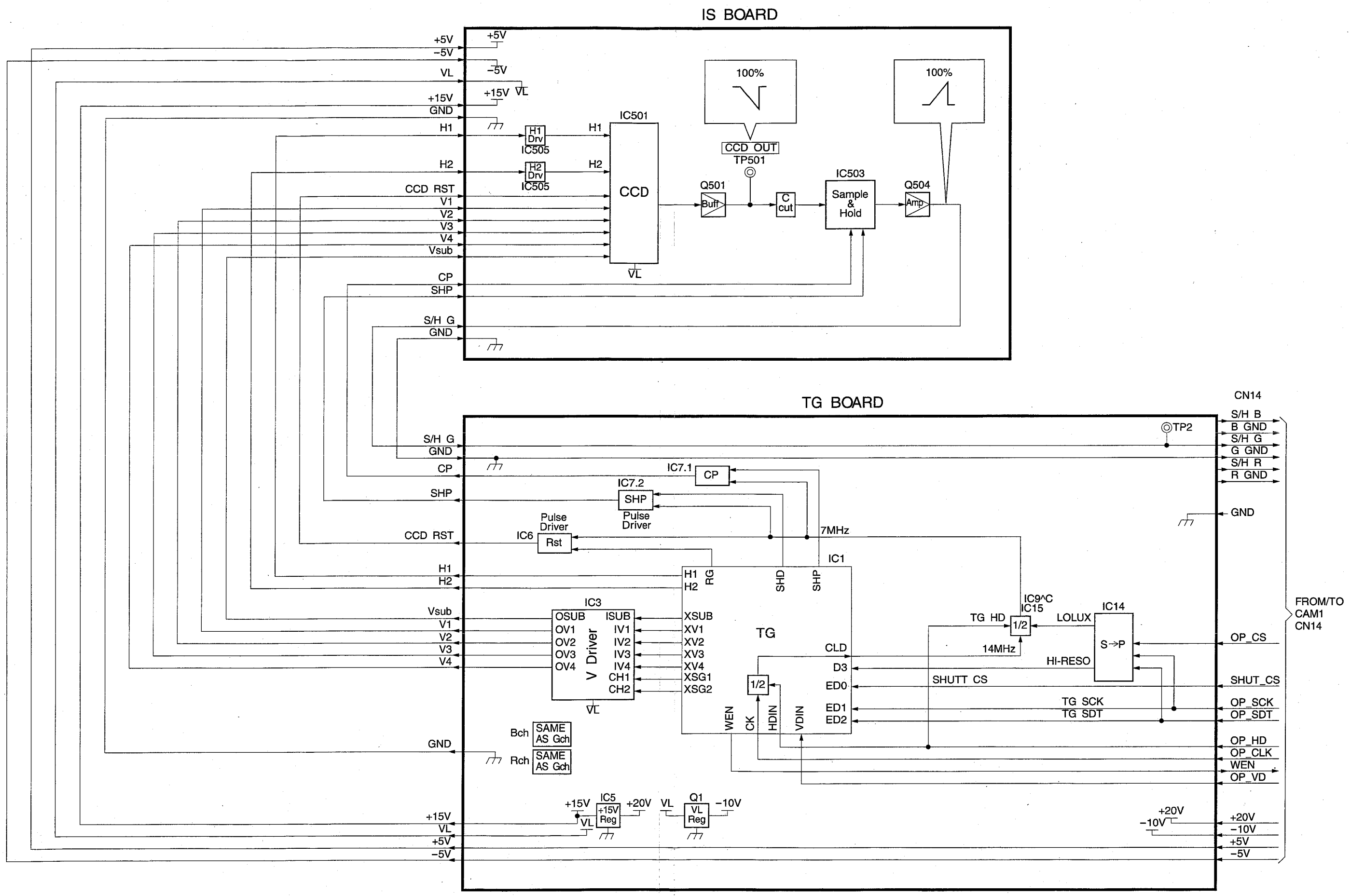
· CONN.

– SIDE A –

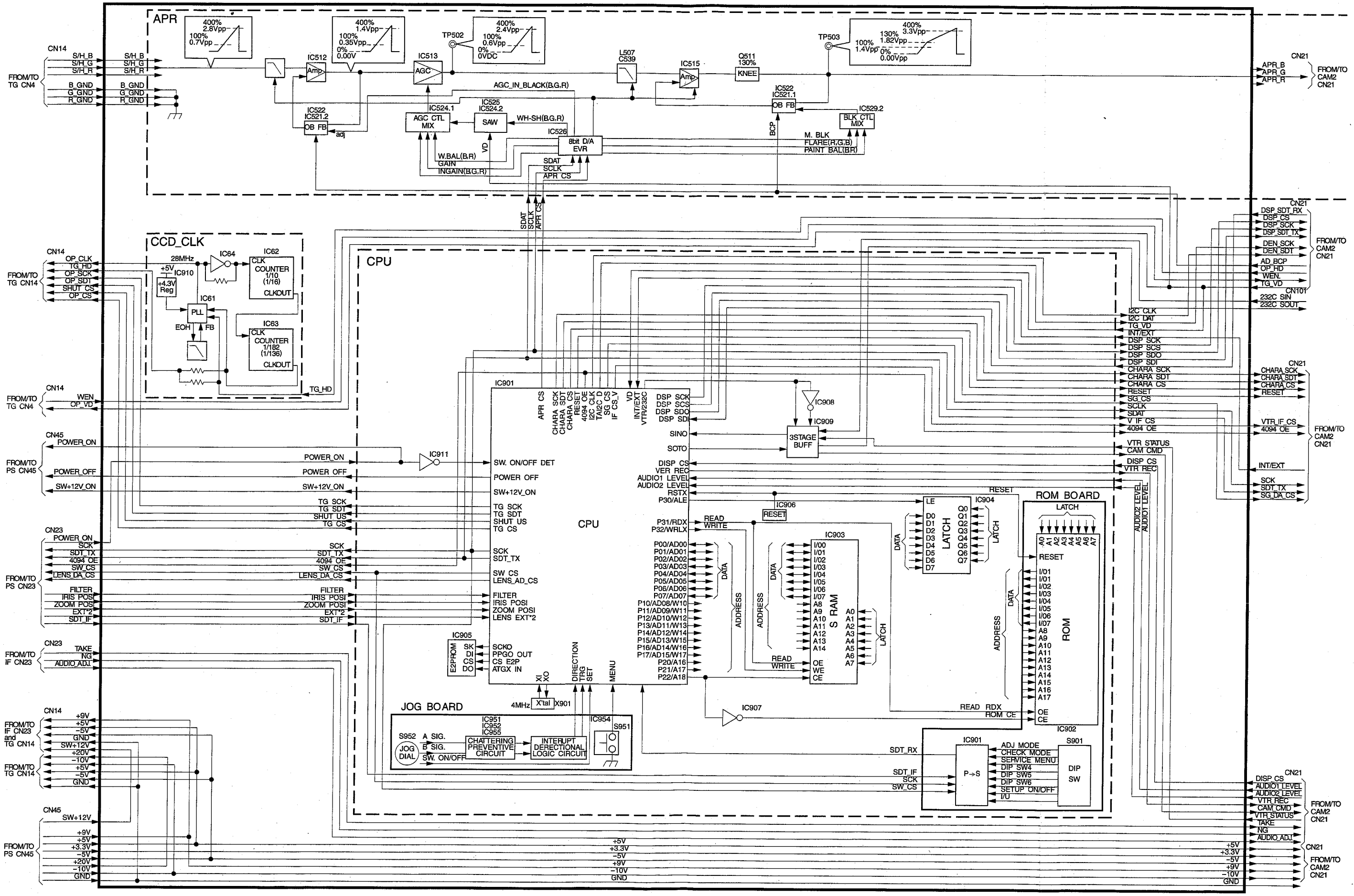


SL82088-04-001

4.38 IS & TG BORAD BLOCK DIAGRAM (G channel)

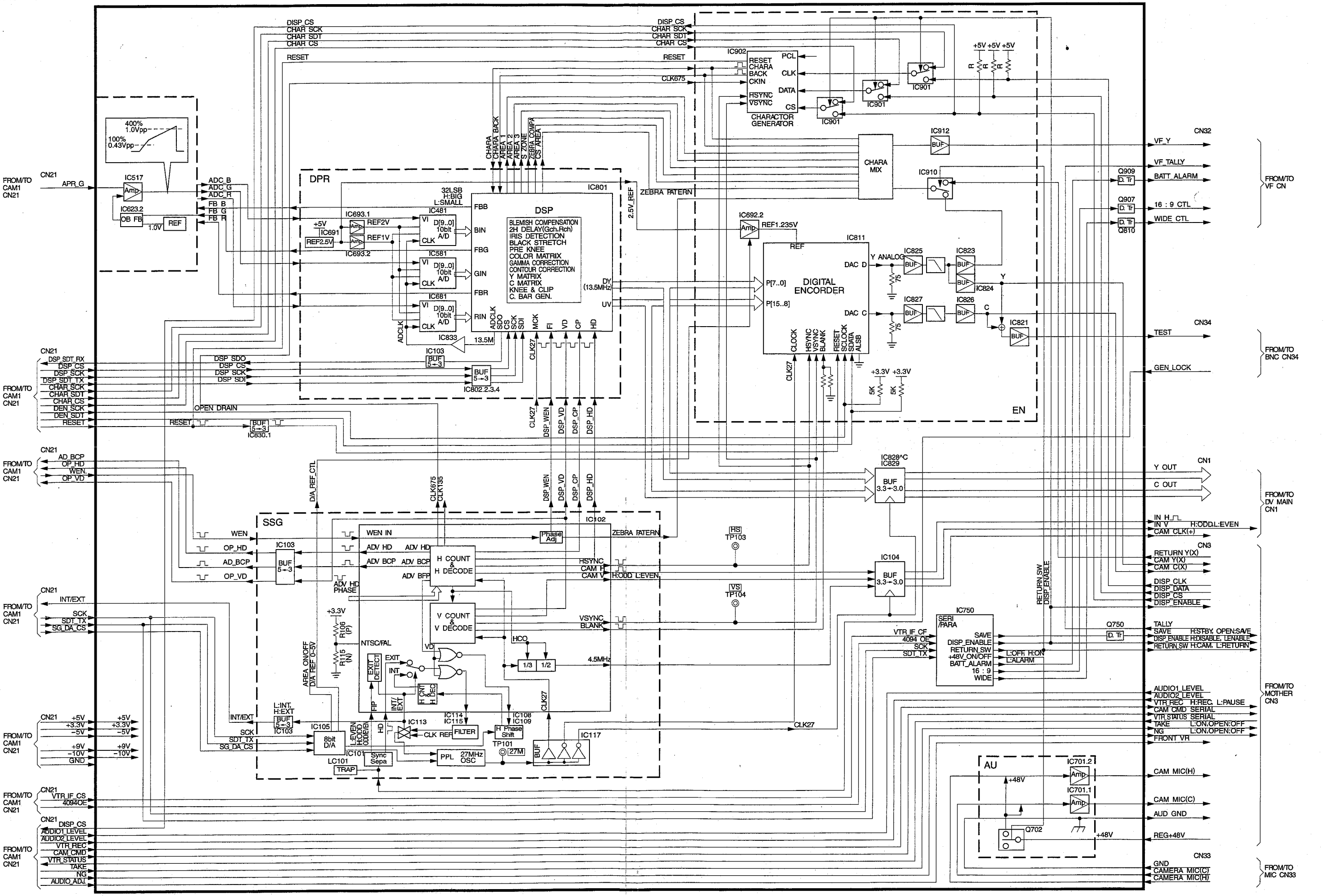

IS BOARD
+5V
-5V
VL
+15V
GND
H1
H2
CCD RST
V1
V2
V3
V4
Vsub
CP
SHP
S/H G
GND
H1 Drv
IC505
H2 Drv
IC505
IC501
CCD
100%
CCD OUT
TP501
Q501
Buff
C cut
IC503
Sample & Hold
Q504
Amp
TG BOARD
CN14
S/H B
B GND
S/H G
G GND
S/H R
R GND
TP2
GND
IC7.1
CP
IC7.2
SHP
Pulse Driver
IC6
Rst
7MHz
IC1
RG
SHD
SHP
TG
XSUB
XV1
XV2
XV3
XV4
XSG1
XSG2
CLD
D3
ED0
ED1
ED2
WEN
CK
HDIN
VDIN
1/2
IC3
OSUB
OV1
OV2
OV3
OV4
ISUB
IV1
IV2
IV3
IV4
CH1
CH2
V Driver
IC9^C
IC15
TG HD
14MHz
IC14
LOLUX
S->P
HI-RESO
SHUTT CS
TG SCK
TG SDT
FROM/TO CAM1 CN14
OP_CS
SHUT_CS
OP_SCK
OP_SDT
OP_HD
OP_CLK
WEN
OP_VD
Bch SAME AS Gch
Rch SAME AS Gch
IC5
+15V Reg
+20V
Q1
VL Reg
-10V
+20V
-10V
+5V
-5V

4.39 CAM1 BOARD BLOCK DIAGRAM

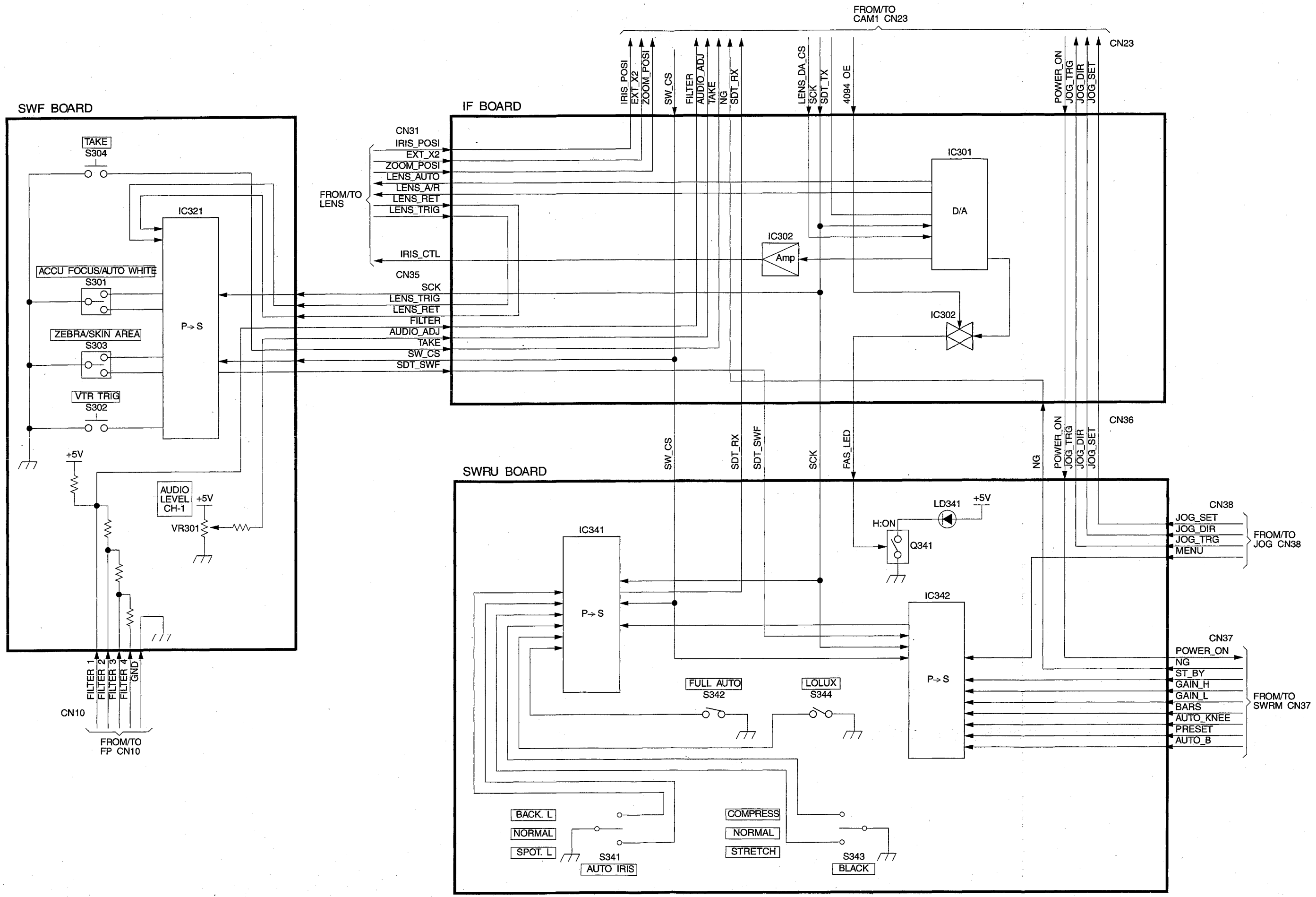


APR
CCD_CLK
CPU
CN14
FROM/TO TG CN4
S/H_B
S/H_G
S/H_R
B_GND
G_GND
R_GND
IC512
Amp
IC513
AGC
TP502
L507 C539
IC515
Amp
Q511 130%
KNEE
TP503
400% 2.8Vpp 100% 0.7Vpp
400% 1.4Vpp 100% 0.35Vpp 0% 0.00V
400% 2.4Vpp 100% 0.6Vpp 0% 0VDC
400% 130% 3.3Vpp 1.82Vpp 100% 1.4Vpp 0% 0.00Vpp
AGC_IN_BLACK(B,G,R)
IC522 IC521.2
OB FB
adj
IC524.1
AGC CTL MIX
IC525 IC524.2
SAW
WH-SH(B,G,R)
IC526
8bit D/A EVR
IC522 IC521.1
OB FB
IC529.2
BLK CTL MIX
BCP
M. BLK
FLARE(R,G,B)
PAINT BAL(B,R)
VD
W.BAL(B,R)
GAIN
INGAIN(B,G,R)
SDAT
SCLK
APR CS
CN21
APR_B
APR_G
APR_R
FROM/TO CAM2 CN21
DSP_SDT_RX
DSP_CS
DSP_SCK
DSP_SDT_TX
DEN_SCK
DEN_SDT
AD_BCP
OP_HD
WEN.
TG_VD
CN101
232C SIN
232C SOUT
OP_CLK
TG_HD
OP_SCK
OP_SDT
SHUT_CS
OP_CS
FROM/TO TG CN14
28MHz
+5V
IC910
+4.3V Reg
IC64
IC62
CLK COUNTER 1/10 (1/16)
CLKOUT
IC61
PLL
EOH
FB
IC63
CLK COUNTER 1/182 (1/136)
CLKOUT
TG_HD
WEN
OP_VD
FROM/TO TG CN4
CN45
POWER_ON
FROM/TO PS CN45
POWER_OFF
SW+12V_ON
IC911
IC901
APR CS
CHARA SCK
CHARA SDT
CHARA CS
RESET
4094 OE
I2C CLK
TAI2C D
SG CS
IF CS_V
VD
INT/EXT
VTR/232C
SW. ON/OFF DET
POWER OFF
SW+12V_ON
TG SCK
TG SDT
SHUT US
TG CS
SCK
SDT_TX
SW CS
LENS_AD_CS
FILTER
IRIS POSI
ZOOM POSI
LENS EXT*2
SCKO
PPGO OUT
CS E2P
ATGX IN
DSP SCK
DSP SCS
DSP SDO
DSP SDI
SINO
SOTO
DISP CS
VER REC
AUDIO1 LEVEL
AUDIO2 LEVEL
RSTX
P30/ALE
P31/RDX
P32/WRLX
P00/AD00
P01/AD01
P02/AD02
P03/AD03
P04/AD04
P05/AD05
P06/AD06
P07/AD07
P10/AD08/W10
P11/AD09/W11
P12/AD10/W12
P13/AD11/W13
P14/AD12/W14
P15/AD13/W15
P16/AD14/W16
P17/AD15/W17
P20/A16
P21/A17
P22/A18
X1
XO
DIRECTION
TRG
SET
MENU
4MHz
X'tal
X901
IC908
IC909
3STAGE BUFF
IC906
RESET
READ
WRITE
DATA
ADDRESS
IC903
I/00
I/01
I/02
I/03
I/04
I/05
I/06
I/07
A8
A9
A10
A11
A12
A13
A14
S RAM
A0
A1
A2
A3
A4
A5
A6
A7
LATCH
OE
WE
CE
IC904
LE
D0
D1
D2
D3
D4
D5
D6
D7
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
ROM BOARD
ROM
IC902
A17
READ RDX
ROM CE
IC907
I2C CLK
I2C DAT
TG_VD
INT/EXT
DSP SCK
DSP SCS
DSP SDO
DSP SDI
CHARA SCK
CHARA SDT
CHARA CS
RESET
SG_CS
SCLK
SDAT
V IF CS
4094 OE
VTR STATUS
CAM CMD
DISP CS
VTR REC
AUDIO2 LEVEL
AUDIO1 LEVEL
CHARA SCK
CHARA SDT
CHARA CS
RESET
VTR_IF_CS
4094 OE
INT/EXT
SCK
SDT_TX
SG_DA_CS
CN23
POWER_ON
SCK
SDT_TX
4094_OE
SW_CS
LENS_DA_CS
FROM/TO PS CN23
FILTER
IRIS POSI
ZOOM POSI
EXT*2
SDT_IF
TAKE
NG
AUDIO_ADJ
FROM/TO IF CN23
IC905
E2PROM
SK
DI
CS
DO
JOG BOARD
S952
JOG DIAL
A SIG.
B SIG.
SW. ON/OFF
IC951 IC952 IC955
CHATTERING PREVENTIVE CIRCUIT
INTERUPT DERECTIONAL LOGIC CIRCUIT
IC954
S951
SDT_RX
SDT_IF
SCK
SW_CS
IC901
P→S
ADJ MODE
CHECK MODE
SERVICE MENU
DIP SW4
DIP SW5
DIP SW6
SETUP ON/OFF
I/U
S901
DIP SW
DISP CS
AUDIO1_LEVEL
AUDIO2_LEVEL
VTR REC
CAM_CMD
VTR_STATUS
TAKE
NG
AUDIO_ADJ
+9V
+5V
−5V
GND
SW+12V
+20V
−10V
FROM/TO IF CN23 and TG CN14
FROM/TO TG CN14
SW+12V
+3.3V
FROM/TO PS CN45
+5V
+3.3V
−5V
+9V
−10V
GND

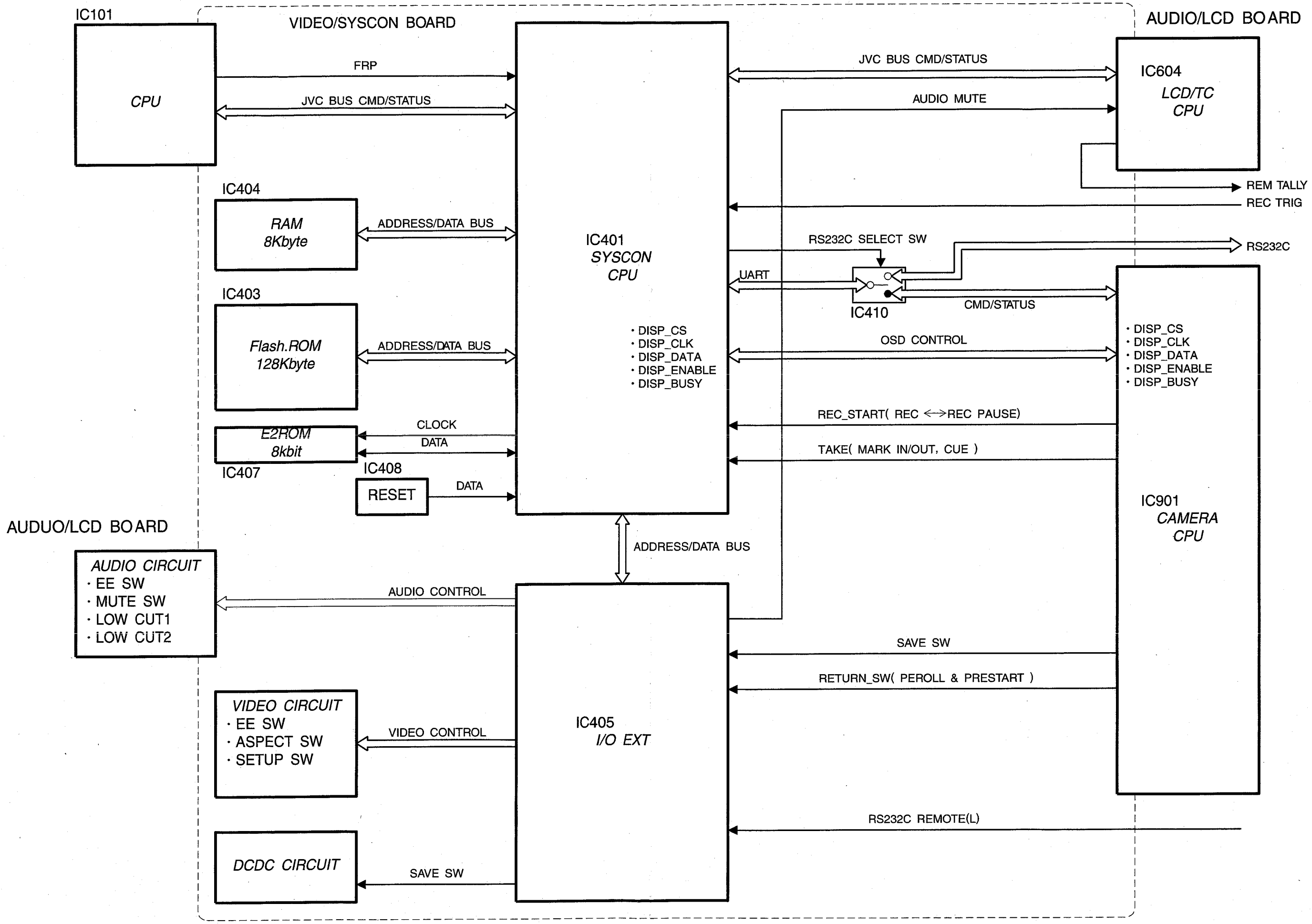
4.40 CAM2 BOARD BLOCK DIAGRAM


DISP_CS
CHAR_SCK
CHAR_SDT
CHAR_CS
RESET
CLK675
IC902
RESET
CHARA
BACK
CKIN
HSYNC
VSYNC
PCL
CLK
DATA
CS
CHARACTOR GENERATOR
IC901
+5V +5V +5V
R
FROM/TO CAM1 CN21
CN21
APR_G
IC517
Amp
IC623.2
OB FB
1.0V
REF
400% 1.0Vpp
100% 0.43Vpp
ADC_B
ADC_G
ADC_R
FB_B
FB_G
FB_R
DPR
CHARA
CHARA BACK
AREA 1
AREA 2
AREA 3
S ZONE
ZEBRA COMPA
CS AREA
32LSB H:BIG L:SMALL
IC801
DSP
BLEMISH COMPENSATION
2H DELAY(Gch,Rch)
IRIS DETECTION
BLACK STRETCH
PRE KNEE
COLOR MATRIX
GAMMA CORRECTION
CONTOUR CORRECTION
Y MATRIX
C MATRIX
KNEE & CLIP
C. BAR GEN.
FBB
BIN
FBG
GIN
FBR
RIN
DY (13.5MHz)
UV
ADCLK
SDO
CS
SCK
SDI
MCK
FI
VD
CP
HD
2.5V_REF
ZEBRA PATERN
IC693.1
IC693.2
IC481
IC581
IC681
REF2V
REF1V
+5V
IC691
REF2.5V
VI
D[9..0] 10bit A/D
CLK
ADCLK
IC833
13.5M
IC103
BUF 5→3
IC802.2.3.4
CHARA MIX
IC912
BUF
IC910
Q909
Q907
Q810
D. Tr
VF_Y
VF_TALLY
BATT_ALARM
16 : 9 CTL
WIDE CTL
CN32
FROM/TO VF CN
IC692.2
Amp
REF1.235V
IC811
REF
DIGITAL ENCORDER
P[7..0]
P[15..8]
DAC D
DAC C
CLOCK
HSYNC
VSYNC
BLANK
RESET
SCLOCK
SDATA
ALSB
Y ANALOG
IC825
IC823
IC824
IC827
IC826
IC821
75
Y
C
CN34
TEST
GEN_LOCK
FROM/TO BNC CN34
+3.3V +3.3V
5K 5K
EN
CLK27
DSP_SDO
DSP_CS
DSP_SCK
DSP_SDI
DSP_SDT_RX
DSP_CS
DSP_SCK
DSP_SDT_TX
CHAR_SCK
CHAR_SDT
CHAR_CS
DEN_SCK
DEN_SDT
RESET
OPEN DRAIN
IC830.1
CLK27
DSP_WEN
DSP_VD
DSP_CP
DSP_HD
AD_BCP
OP_HD
WEN
OP_VD
D/A_REF_CTL
CLK675
CLK135
IC828^C
IC829
BUF 3.3→3.0
Y OUT
C OUT
CN1
FROM/TO DV MAIN CN1
IN H
IN V H:ODD,L:EVEN
CAM CLK(+)
SSG
IC102
WEN IN
Phase Adj
ADV HD
ADV BCP
ADV BFP
ADV HD PHASE
H COUNT & H DECODE
V COUNT & V DECODE
ZEBRA PATERN
HSYNC
CAM H
CAM V
H:ODD L:EVEN
VSYNC
BLANK
HS TP103
VS TP104
IC104
BUF 3.3→3.0
CN3
RETURN Y(X)
CAM Y(X)
CAM C(X)
DISP_CLK
DISP_DATA
DISP_CS
DISP_ENABLE
RETURN SW
DISP_ENABLE
+3.3V
R106 (P)
R115 (N)
NTSC/PAL
AREA ON/OFF D/A REF 0-5V
EXIT DETECT
EXIT
INT
VD
HCO
1/3
1/2
4.5MHz
H CNT H DEC
FIP
INT/EXT
HD
L:EVEN H:ODD ODD/EVEN
IC113
CLK REF
IC114 IC115
FILTER
IC108 IC109
H Phase Shift
TP101
27M
PPL
27MHz OSC
IC117
BUF
CLK27
IC105
8bit D/A
IC101
LC101
Sync Sepa
TRAP
L:INT, H:EXT
INT/EXT
SCK
SDT_TX
SG_DA_CS
INT/EXT
SCK
SDT_TX
SG_DA_CS
IC750
SERI /PARA
VTR IF CF
4094 OE
SCK
SDT_TX
SAVE
DISP_ENABLE
RETURN_SW
+48V_ON/OFF
BATT_ALARM
16 : 9
WIDE
L:OFF H:ON
L:ALARM
Q750
TALLY
SAVE H:ST-BY, OPEN:SAVE
DISP ENABLE H:DISABLE, L:ENABLE
RETURN SW H:CAM, L:RETURN
AUDIO1_LEVEL
AUDIO2_LEVEL
VTR_REC H:REC, L:PAUSE
CAM CMD SERIAL
VTR STATUS SERIAL
TAKE L:ON,OPEN:OFF
NG L:ON,OPEN:OFF
FRONT VR
FROM/TO MOTHER CN3
+5V
+3.3V
−5V
+9V
−10V
GND
VTR_IF_CS
4094OE
DISP_CS
AUDIO1_LEVEL
AUDIO2_LEVEL
VTR_REC
CAM_CMD
VTR_STATUS
TAKE
NG
AUDIO_ADJ
AU
IC701.2
IC701.1
Amp
+48V
Q702
CAM MIC(H)
CAM MIC(C)
AUD GND
REG+48V
CN33
GND
CAMERA MIC(C)
CAMERA MIC(H)
FROM/TO MIC CN33

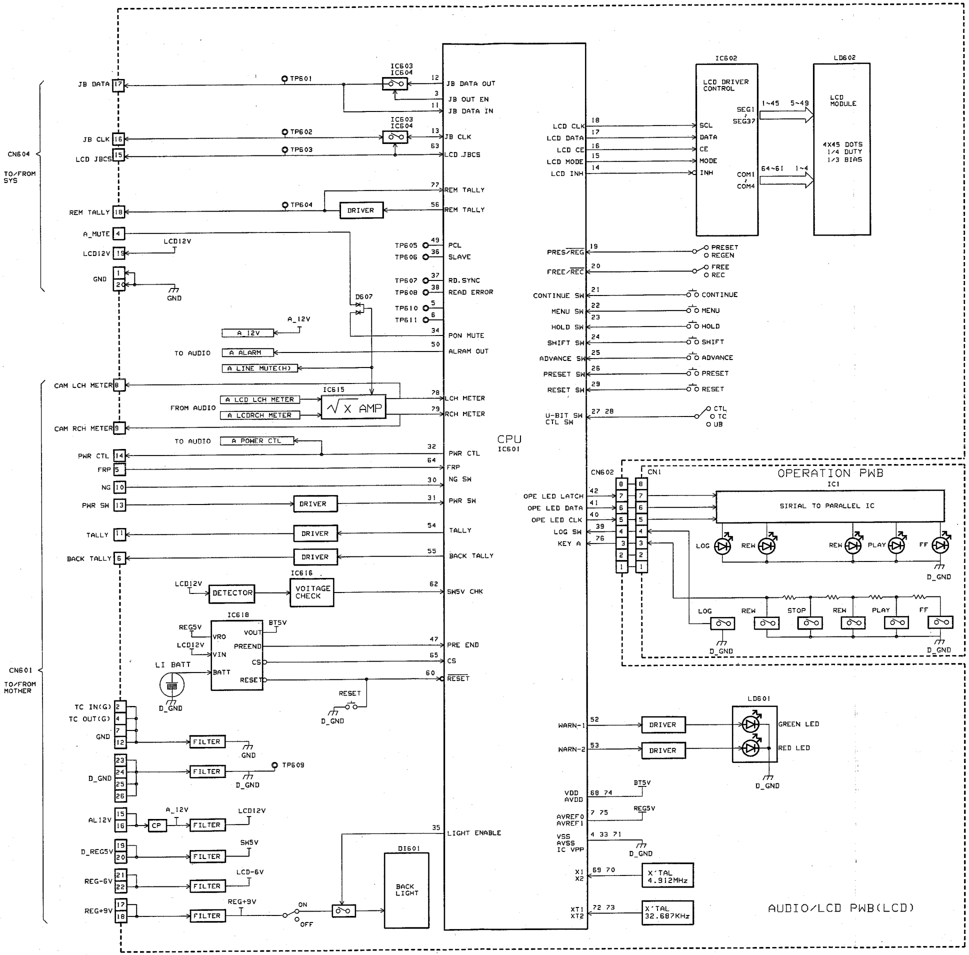
4.41 IF, SWF, SWRU BLOCK DIAGRAM


FROM/TO
CAM1 CN23
CN23
IRIS_POSI
EXT_X2
ZOOM_POSI
SW_CS
FILTER
AUDIO_ADJ
TAKE
NG
SDT_RX
LENS_DA_CS
SCK
SDT_TX
4094 OE
POWER_ON
JOG_TRG
JOG_DIR
JOG_SET
SWF BOARD
TAKE
S304
IC321
ACCU FOCUS/AUTO WHITE
S301
P→S
ZEBRA/SKIN AREA
S303
VTR TRIG
S302
+5V
AUDIO
LEVEL
CH-1
+5V
VR301
FILTER 1
FILTER 2
FILTER 3
FILTER 4
GND
CN10
FROM/TO
FP CN10
IF BOARD
CN31
IRIS_POSI
EXT_X2
ZOOM_POSI
LENS_AUTO
LENS_A/R
LENS_RET
LENS_TRIG
FROM/TO
LENS
IRIS_CTL
CN35
SCK
LENS_TRIG
LENS_RET
FILTER
AUDIO_ADJ
TAKE
SW_CS
SDT_SWF
IC301
D/A
IC302
Amp
IC302
CN36
SW_CS
SDT_RX
SDT_SWF
SCK
FAS_LED
NG
POWER_ON
JOG_TRG
JOG_DIR
JOG_SET
SWRU BOARD
LD341
+5V
H:ON
Q341
IC341
P→S
IC342
P→S
CN38
JOG_SET
JOG_DIR
JOG_TRG
MENU
FROM/TO
JOG CN38
CN37
POWER_ON
NG
ST_BY
GAIN_H
GAIN_L
BARS
AUTO_KNEE
PRESET
AUTO_B
FROM/TO
SWRM CN37
FULL AUTO
S342
LOLUX
S344
BACK. L
NORMAL
SPOT. L
S341
AUTO IRIS
COMPRESS
NORMAL
STRETCH
S343
BLACK

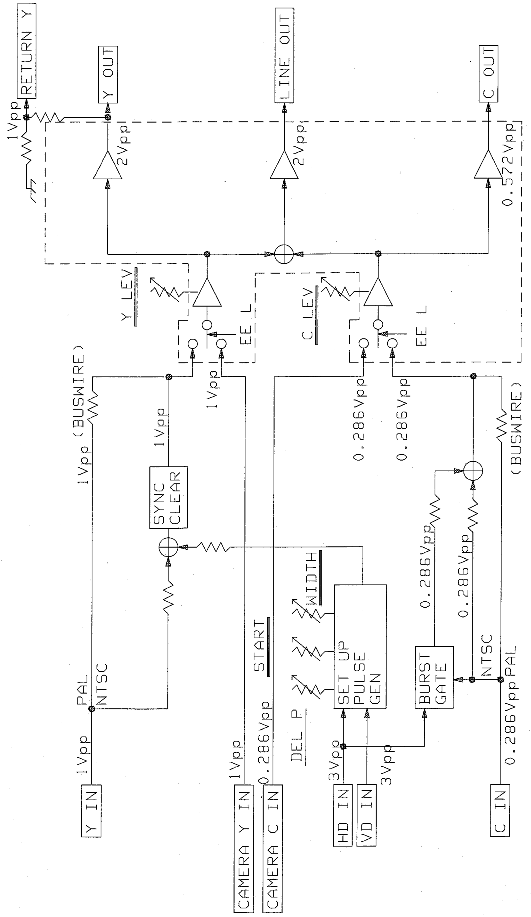
4.42 SYSCON BLOCK DIAGRAM


IC101
CPU
VIDEO/SYSCON BOARD
FRP
JVC BUS CMD/STATUS
IC404
RAM
8Kbyte
ADDRESS/DATA BUS
IC403
Flash.ROM
128Kbyte
ADDRESS/DATA BUS
E2ROM
8kbit
IC407
CLOCK
DATA
IC408
RESET
DATA
IC401
SYSCON
CPU
· DISP_CS
· DISP_CLK
· DISP_DATA
· DISP_ENABLE
· DISP_BUSY
AUDIO/LCD BOARD
IC604
LCD/TC
CPU
JVC BUS CMD/STATUS
AUDIO MUTE
REM TALLY
REC TRIG
RS232C SELECT SW
RS232C
UART
IC410
CMD/STATUS
OSD CONTROL
· DISP_CS
· DISP_CLK
· DISP_DATA
· DISP_ENABLE
· DISP_BUSY
REC_START(REC <-> REC PAUSE)
TAKE(MARK IN/OUT, CUE)
IC901
CAMERA
CPU
ADDRESS/DATA BUS
AUDUO/LCD BOARD
AUDIO CIRCUIT
· EE SW
· MUTE SW
· LOW CUT1
· LOW CUT2
AUDIO CONTROL
IC405
I/O EXT
SAVE SW
RETURN_SW(PEROLL & PRESTART)
VIDEO CIRCUIT
· EE SW
· ASPECT SW
· SETUP SW
VIDEO CONTROL
RS232C REMOTE(L)
DCDC CIRCUIT
SAVE SW

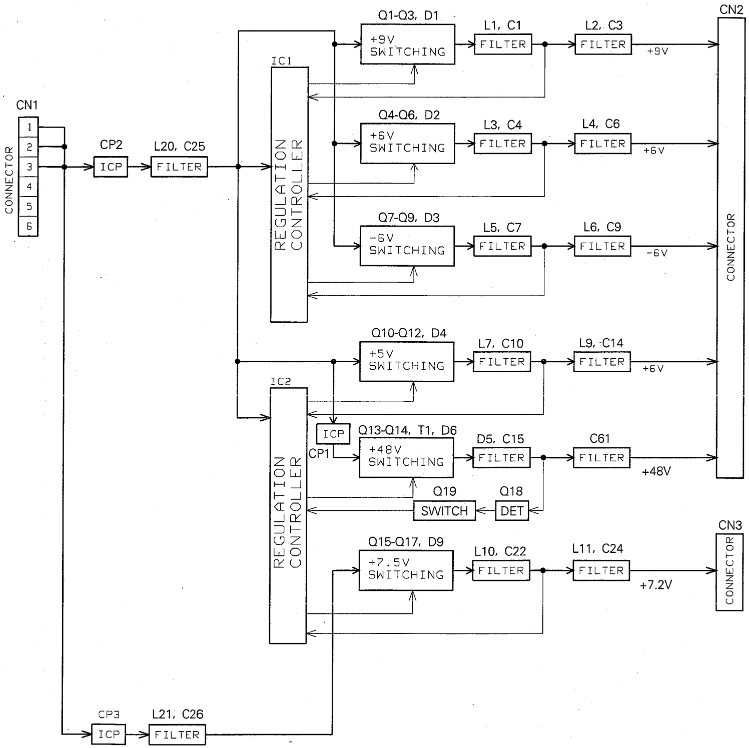
4.43 LCD BLOCK DIAGRAM


CN604
TO/FROM SYS
JB DATA 17
JB CLK 16
LCD JBCS 15
REM TALLY 18
A_MUTE 4
LCD12V 19
GND 1 2
TP601
TP602
TP603
TP604
IC603
IC604
DRIVER
JB DATA OUT
JB OUT EN
JB DATA IN
JB CLK
LCD JBCS
REM TALLY
TP605 PCL
TP606 SLAVE
TP607 RD.SYNC
TP608 READ ERROR
TP610
TP611
D607
A_12V
PON MUTE
ALRAM OUT
TO AUDIO
A ALARM
A LINE MUTE(H)
CN601
TO/FROM MOTHER
CAM LCH METER 8
CAM RCH METER 9
IC615
FROM AUDIO
A LCD LCH METER
A LCDRCH METER
√X AMP
LCH METER
RCH METER
A POWER CTL
PWR CTL 14
FRP 5
NG 10
PWR SW 13
TALLY 11
BACK TALLY 6
NG SW
PWR SW
BACK TALLY
IC616
DETECTOR
VOLTAGE CHECK
SW5V CHK
IC618
REG5V
BT5V
VRO
VOUT
VIN
PREEND
CS
BATT
RESET
LI BATT
D_GND
PRE END
RESET
TC IN(G) 2
TC OUT(G) 4
GND 7 12
D_GND 23 24 25 26
AL12V 15 16
D_REG5V 19 20
REG-6V 21 22
REG+9V 17 18
FILTER
TP609
CP
SW5V
LCD-6V
REG+9V
ON
OFF
DI601
BACK LIGHT
LIGHT ENABLE
CPU
IC601
IC602
LCD DRIVER CONTROL
SCL
DATA
CE
MODE
INH
SEG1 ~ SEG37
COM1 ~ COM4
1~45 5~49
64~61 1~4
LD602
LCD MODULE
4X45 DOTS
1/4 DUTY
1/3 BIAS
LCD CLK
LCD DATA
LCD CE
LCD MODE
LCD INH
PRES/REG
PRESET
REGEN
FREE/REC
FREE
REC
CONTINUE SW
MENU SW
HOLD SW
SHIFT SW
ADVANCE SW
PRESET SW
RESET SW
U-BIT SW
CTL SW
CTL
TC
UB
CN602
CN1
OPERATION PWB
IC1
SIRIAL TO PARALLEL IC
OPE LED LATCH
OPE LED DATA
OPE LED CLK
LOG SW
KEY A
LOG
REW
STOP
PLAY
FF
LD601
WARN-1
WARN-2
GREEN LED
RED LED
VDD
AVDD
AVREF0
AVREF1
VSS
AVSS
IC VPP
X1
X2
XT1
XT2
X'TAL 4.912MHz
X'TAL 32.687KHz
AUDIO/LCD PWB(LCD)

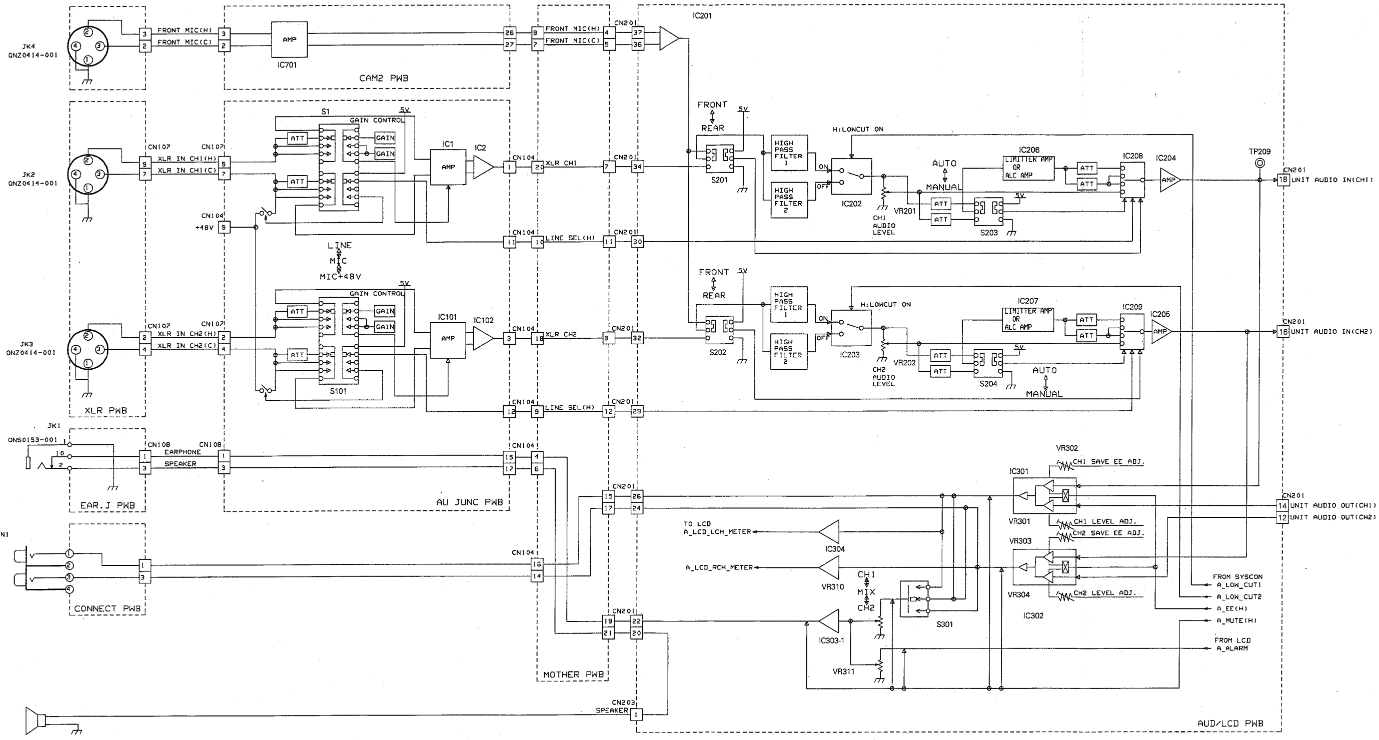
4.44 VIDEO BLOCK DIAGRAM


RETURN Y
Y OUT
LINE OUT
C OUT
1Vpp
2Vpp
2Vpp
0.572Vpp
Y LEV
EE L
C LEV
EE L
1Vpp (BUSWIRE)
1Vpp
1Vpp
0.286Vpp
0.286Vpp
(BUSWIRE)
SYNC CLEAR
WIDTH
START
DEL P
SET UP PULSE GEN
BURST GATE
0.286Vpp
0.286Vpp
NTSC
PAL
PAL
NTSC
1Vpp
1Vpp
0.286Vpp
3Vpp
3Vpp
0.286Vpp
Y IN
CAMERA Y IN
CAMERA C IN
HD IN
VD IN
C IN

4.45 REG BLOCK DIAGRAM

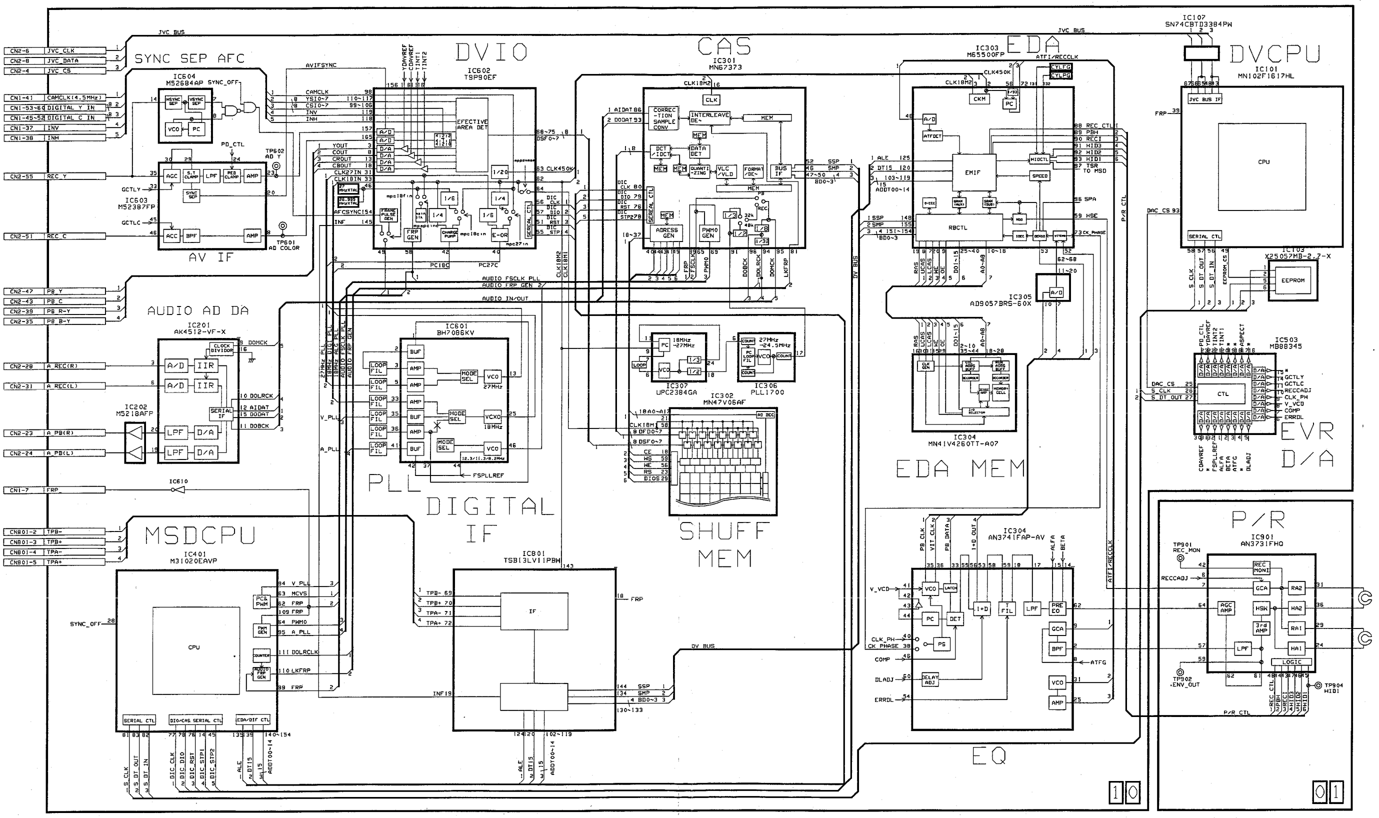

CN1
CONNECTOR
1
2
3
4
5
6
CP2
ICP
L20, C25
FILTER
IC1
REGULATION CONTROLLER
Q1-Q3, D1
+9V SWITCHING
L1, C1
FILTER
L2, C3
FILTER
+9V
Q4-Q6, D2
+6V SWITCHING
L3, C4
FILTER
L4, C6
FILTER
+6V
Q7-Q9, D3
-6V SWITCHING
L5, C7
FILTER
L6, C9
FILTER
-6V
Q10-Q12, D4
+5V SWITCHING
L7, C10
FILTER
L9, C14
FILTER
+6V
IC2
REGULATION CONTROLLER
ICP
CP1
Q13-Q14, T1, D6
+48V SWITCHING
D5, C15
FILTER
C61
FILTER
+48V
Q19
SWITCH
Q18
DET
Q15-Q17, D9
+7.5V SWITCHING
L10, C22
FILTER
L11, C24
FILTER
+7.2V
CN2
CONNECTOR
CN3
CONNECTOR
CP3
ICP
L21, C26
FILTER

4.46 AUDIO BLOCK DIAGRAM



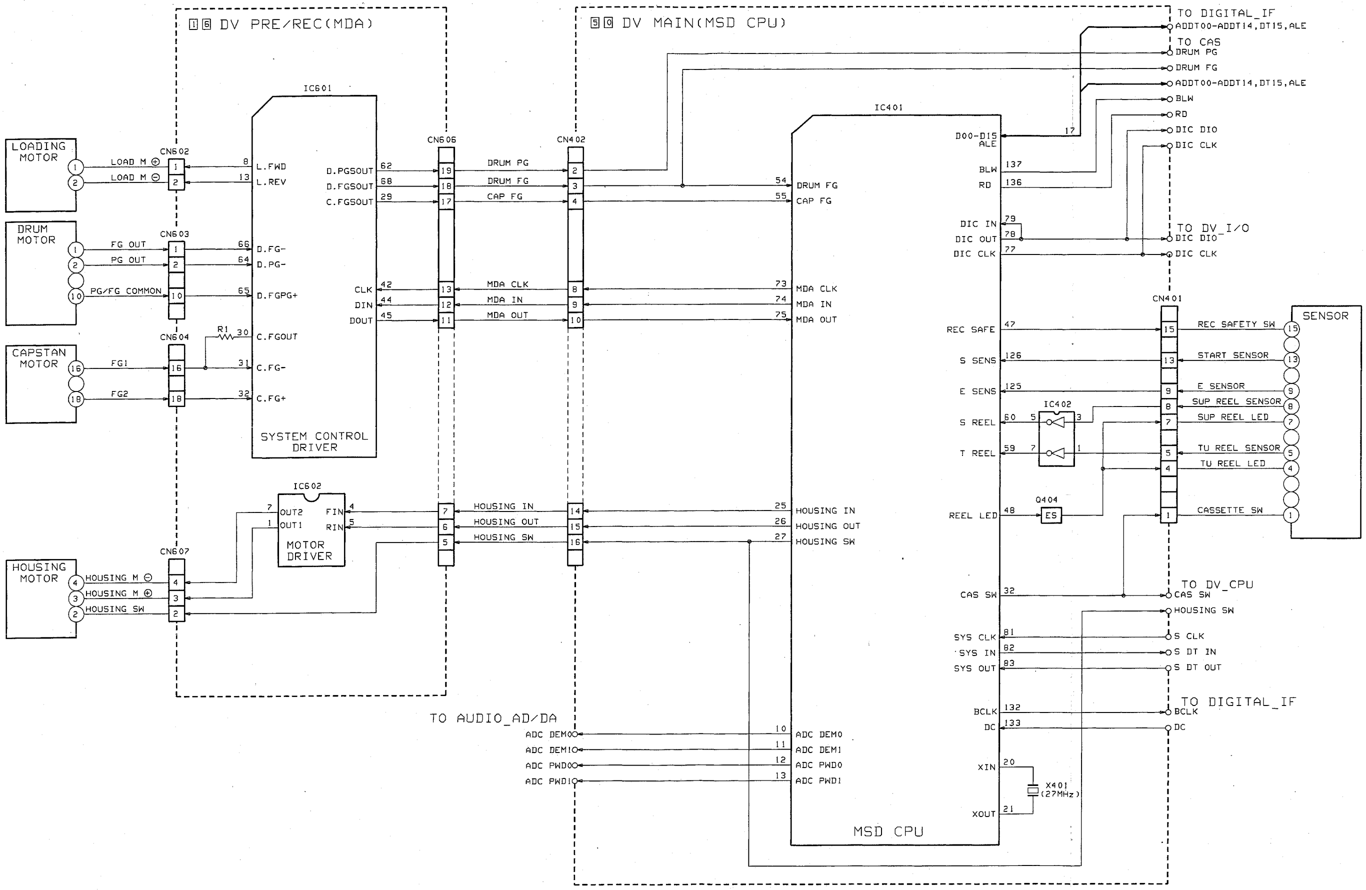
JK4
QNZ0414-001
FRONT MIC(H)
FRONT MIC(C)
AMP
IC701
CAM2 PWB
FRONT MIC(H)
FRONT MIC(C)
CN201
IC201
JK2
QNZ0414-001
CN107
XLR IN CH1(H)
XLR IN CH1(C)
S1
5V
GAIN CONTROL
ATT
GAIN
IC1
IC2
AMP
CN104
XLR CH1
+48V
LINE SEL(H)
LINE
MIC
MIC+48V
FRONT
REAR
S201
HIGH PASS FILTER 1
HIGH PASS FILTER 2
H:LOWCUT ON
ON
OFF
IC202
CH1 AUDIO LEVEL
VR201
AUTO
MANUAL
IC206
LIMITTER AMP OR ALC AMP
S203
IC208
IC204
TP209
UNIT AUDIO IN(CH1)
JK3
QNZ0414-001
XLR IN CH2(H)
XLR IN CH2(C)
IC101
IC102
XLR CH2
S101
S202
IC203
CH2 AUDIO LEVEL
VR202
IC207
S204
IC209
IC205
UNIT AUDIO IN(CH2)
XLR PWB
JK1
QNS0153-001
CN108
EARPHONE
SPEAKER
EAR.J PWB
AU JUNC PWB
VR302
CH1 SAVE EE ADJ.
IC301
VR301
CH1 LEVEL ADJ.
CH2 SAVE EE ADJ.
VR303
UNIT AUDIO OUT(CH1)
UNIT AUDIO OUT(CH2)
TO LCD
A_LCD_LCH_METER
IC304
A_LCD_RCH_METER
VR310
CH1
MIX
CH2
S301
VR304
CH2 LEVEL ADJ.
IC302
FROM SYSCON
A_LOW_CUT1
A_LOW_CUT2
A_EE(H)
A_MUTE(H)
FROM LCD
A_ALARM
IC303-1
VR311
CN1
CONNECT PWB
MOTHER PWB
CN203
SPEAKER
AUD/LCD PWB

4.47 DV BLOCK DIAGRAM 1/2



SYNC SEP AFC
IC604 M52684AP
AV IF
IC603 M52387FP
DVIO
IC602 TSP90EF
CAS
IC301 MN67373
EDA
IC303 M65500FP
DVCPU
IC101 MN102F1617HL
IC107 SN74CBTD3384PW
IC103 X25057MB-2.7-X
EEPROM
CPU
AUDIO AD DA
IC201 AK4512-VF-X
IC202 M5218AFP
PLL
IC601 BH7086KV
DIGITAL IF
IC801 TSB13LV11PBW
SHUFF MEM
IC302 MN47V06AF
IC307 UPC2384GA
IC306 PLL1700
IC305 AD9057BRS-60X
IC304 MN41V4260TT-A07
EDA MEM
IC503 MB88345
EVR D/A
MSDCPU
IC401 M31020EAVP
EQ
IC304 AN3741FAP-AV
P/R
IC901 AN3731FHQ
TP901 REC_MON
TP902 ENV_OUT
TP904 HID1
TP601 AD COLOR
TP602 AD Y
JVC BUS
DV BUS
CN2-6 JVC_CLK
CN2-8 JVC_DATA
CN2-4 JVC_CS
CN1-41 CAMCLK(4.5MHz)
CN1-53~60 DIGITAL Y IN
CN1-45~52 DIGITAL C IN
CN1-37 INV
CN1-38 INH
CN2-55 REC Y
CN2-51 REC C
CN2-47 PB Y
CN2-43 PB C
CN2-39 PB R-Y
CN2-35 PB B-Y
CN2-28 A REC(R)
CN2-31 A REC(L)
CN2-23 A PB(R)
CN2-24 A PB(L)
CN1-7 FRP
CN801-2 TPB-
CN801-3 TPB+
CN801-4 TPA-
CN801-5 TPA+
10
01
SL92239

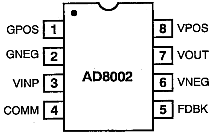
· DV BLOCK DIAGRAM 2/2



16 DV PRE/REC(MDA)
50 DV MAIN(MSD CPU)
LOADING MOTOR
LOAD M ⊕
LOAD M ⊖
CN602
DRUM MOTOR
FG OUT
PG OUT
PG/FG COMMON
CN603
CAPSTAN MOTOR
FG1
FG2
CN604
R1
HOUSING MOTOR
HOUSING M ⊖
HOUSING M ⊕
HOUSING SW
CN607
IC601
L.FWD
L.REV
D.FG-
D.PG-
D.FGPG+
C.FGOUT
C.FG-
C.FG+
D.PGSOUT
D.FGSOUT
C.FGSOUT
CLK
DIN
DOUT
SYSTEM CONTROL DRIVER
IC602
OUT2
OUT1
FIN
RIN
MOTOR DRIVER
CN606
CN402
DRUM PG
DRUM FG
CAP FG
MDA CLK
MDA IN
MDA OUT
HOUSING IN
HOUSING OUT
HOUSING SW
IC401
D00-D15 ALE
BLW
RD
DRUM FG
CAP FG
DIC IN
DIC OUT
DIC CLK
MDA CLK
MDA IN
MDA OUT
REC SAFE
S SENS
E SENS
S REEL
T REEL
REEL LED
HOUSING IN
HOUSING OUT
HOUSING SW
CAS SW
SYS CLK
SYS IN
SYS OUT
BCLK
DC
XIN
XOUT
ADC DEM0
ADC DEM1
ADC PWD0
ADC PWD1
MSD CPU
X401 (27MHz)
IC402
Q404
ES
CN401
SENSOR
REC SAFETY SW
START SENSOR
E SENSOR
SUP REEL SENSOR
SUP REEL LED
TU REEL SENSOR
TU REEL LED
CASSETTE SW
TO DIGITAL_IF
ADDT00-ADDT14,DT15,ALE
TO CAS
DRUM PG
DRUM FG
ADDT00-ADDT14,DT15,ALE
BLW
RD
DIC DIO
DIC CLK
TO DV_I/O
DIC DIO
DIC CLK
TO DV_CPU
CAS SW
HOUSING SW
S CLK
S DT IN
S DT OUT
TO DIGITAL_IF
BCLK
DC
TO AUDIO_AD/DA
ADC DEM0
ADC DEM1
ADC PWD0
ADC PWD1
SL93113

4.48 IC BLOCK DIAGRAMS

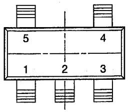
■ AD603AR-X [ANALOG DEVICES] (Variable Gain CTL Amplifier)

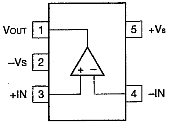

GPOS 1
GNEG 2
VINP 3
COMM 4
AD8002
8 VPOS
7 VOUT
6 VNEG
5 FDBK

■ Pin funoction

Pin No.	Pin Name	
1	GPOS	Gain CTL Input " HI "
2	GNEG	Gain CTL Input " LOW "
3	VINP	Amp. Input
4	COMM	GND
5	FDBK	Feedback
6	VNEG	Vss
7	VOUT	Output
8	VPOS	V$_{DD}$

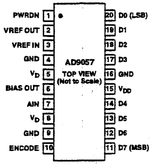
■ AD8031ART-X [ANALOG DEVICES] (Op.Amp.)



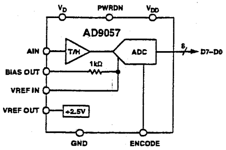

VOUT 1
–Vs 2
+IN 3
5 +Vs
4 –IN
+
–

Top View

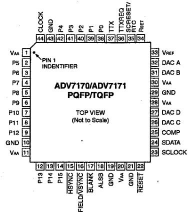
■ AD9057BRS-60-X [ANALOG DEVICES] (8bit A/D Converter)

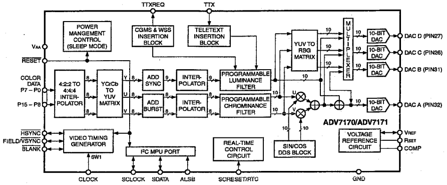

PWRDN 1
VREF OUT 2
VREF IN 3
GND 4
V$_D$ 5
BIAS OUT 6
AIN 7
V$_D$ 8
GND 9
ENCODE 10
20 D0 (LSB)
19 D1
18 D2
17 D3
16 GND
15 V$_{DD}$
14 D4
13 D5
12 D6
11 D7 (MSB)
AD9057
TOP VIEW
(Not to Scale)

(Top View)

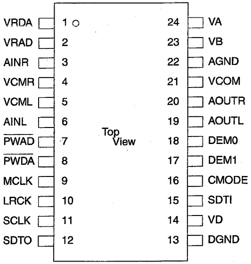

V$_D$
PWRDN
V$_{DD}$
AD9057
AIN
T/H
ADC
8
D7–D0
1kΩ
BIAS OUT
VREF IN
VREF OUT
+2.5V
GND
ENCODE

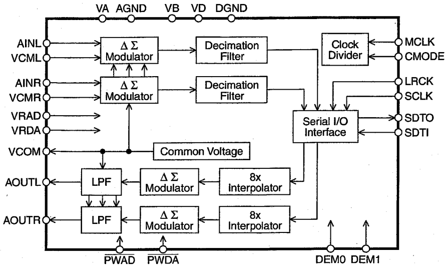
■ ADV7171KS [ANALOG DEVICES] (Digital PAL/NTSC Video Encoder)


CLOCK
GND
P4
P3
P2
P1
P0
TTX
TTXREQ
SCRESET/RTC
R$_{SET}$
44 43 42 41 40 39 38 37 36 35 34
V$_{AA}$ 1
P5 2
P6 3
P7 4
P8 5
P9 6
P10 7
P11 8
P12 9
GND 10
V$_{AA}$ 11
PIN 1 INDENTIFIER
ADV7170/ADV7171
PQFP/TQFP
TOP VIEW
(Not to Scale)
33 V$_{REF}$
32 DAC A
31 DAC B
30 V$_{AA}$
29 GND
28 V$_{AA}$
27 DAC D
26 DAC C
25 COMP
24 SDATA
23 SCLOCK
12 13 14 15 16 17 18 19 20 21 22
P13
P14
P15
HSYNC
FIELD/VSYNC
BLANK
ALSB
GND
V$_{AA}$
GND
RESET

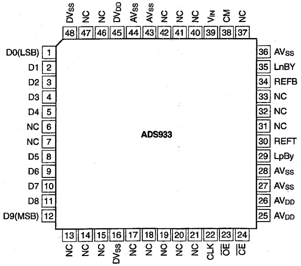

TTXREQ
TTX
POWER MANGEMENT CONTROL (SLEEP MODE)
CGMS & WSS INSERTION BLOCK
TELETEXT INSERTION BLOCK
V$_{AA}$
RESET
COLOR DATA P7 – P0
P15 – P8
4:2:2 TO 4:4:4 INTER-POLATOR
YCrCb TO YUV MATRIX
Y
U
V
8
9
10
ADD SYNC
ADD BURST
INTER-POLATOR
PROGRAMMABLE LUMINANCE FILTER
PROGRAMMABLE CHROMINANCE FILTER
YUV TO RBG MATRIX
MULTIPLEXER
10-BIT DAC
DAC D (PIN27)
DAC C (PIN26)
DAC B (PIN31)
DAC A (PIN32)
ADV7170/ADV7171
HSYNC
FIELD/VSYNC
BLANK
VIDEO TIMING GENERATOR
SW1
I²C MPU PORT
REAL-TIME CONTROL CIRCUIT
SIN/COS DDS BLOCK
VOLTAGE REFERENCE CIRCUIT
V$_{REF}$
R$_{SET}$
COMP
CLOCK
SCLOCK
SDATA
ALSB
SCRESET/RTC
GND

■ AK4518-VF-X [ASAHIKAEI] (16 bit A/D, D/A Convertor for Audio Signal)

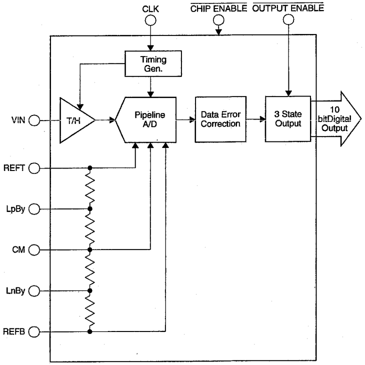

VRDA 1
VRAD 2
AINR 3
VCMR 4
VCML 5
AINL 6
PWAD 7
PWDA 8
MCLK 9
LRCK 10
SCLK 11
SDTO 12
Top View
24 VA
23 VB
22 AGND
21 VCOM
20 AOUTR
19 AOUTL
18 DEM0
17 DEM1
16 CMODE
15 SDTI
14 VD
13 DGND


VA AGND VB VD DGND
AINL
VCML
AINR
VCMR
VRAD
VRDA
VCOM
AOUTL
AOUTR
ΔΣ Modulator
Decimation Filter
Clock Divider
MCLK
CMODE
LRCK
SCLK
SDTO
SDTI
Serial I/O Interface
Common Voltage
LPF
8x Interpolator
PWAD PWDA
DEM0 DEM1

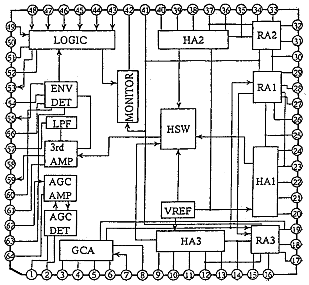
■ ADS933Y-X [BURR-BROWN] (10bit 20MHz A/D Convertor for Video Signal)


DVss NC NC DV$_{DD}$ AVss AVss NC NC NC V$_{IN}$ CM NC
48 47 46 45 44 43 42 41 40 39 38 37
D0(LSB) 1
D1 2
D2 3
D3 4
D4 5
NC 6
NC 7
D5 8
D6 9
D7 10
D8 11
D9(MSB) 12
ADS933
36 AVss
35 LnBY
34 REFB
33 NC
32 NC
31 NC
30 REFT
29 LpBy
28 AVss
27 AVss
26 AV$_{DD}$
25 AV$_{DD}$
13 14 15 16 17 18 19 20 21 22 23 24
NC NC NC DVss NC NC NC NC NC CLK OE CE

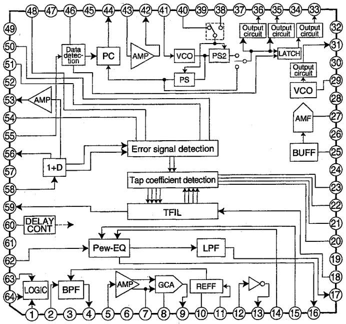
(Top View)


CLK
CHIP ENABLE
OUTPUT ENABLE
Timing Gen.
VIN
T/H
Pipeline A/D
Data Error Correction
3 State Output
10 bitDigital Output
REFT
LpBy
CM
LnBy
REFB

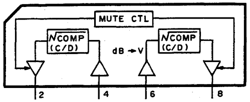
■ AN3731FHQ [MATSUSHITA]
(Pre/Rec Amp.)


LOGIC
HA2
RA2
RA1
MONITOR
ENV DET
LPF
HSW
3rd AMP
AGC AMP
AGC DET
HA1
VREF
GCA
HA3
RA3
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

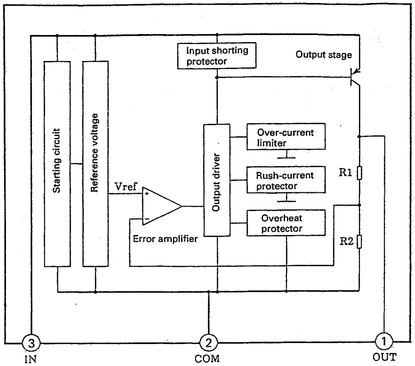
■ AN3741FAP-A [MATSUSHITA]
(Playback Equalizer)


Output circuit
Output circuit
Output circuit
Data detection
PC
AMP
VCO
PS2
LATCH
Output circuit
PS
VCO
AMP
AMF
BUFF
Error signal detection
1+D
Tap coefficient detection
TFIL
DELAY CONT
Pew-EQ
LPF
LOGIC
BPF
AMP
GCA
REFF
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

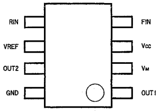
■ BA6138F-X [ROHM]
(Audio Level Detector)


MUTE CTL
Ncomp (C/D)
Ncomp (C/D)
dB → V
2
4
6
8

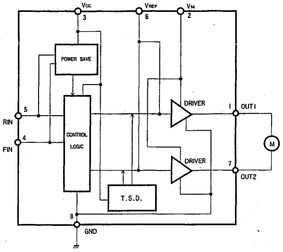
■ AN77L03M-X [MATSUSHITA]
(Voltage Regulator)


Input shorting protector
Output stage
Starting circuit
Reference voltage
Vref
Error amplifier
Output driver
Over-current limiter
Rush-current protector
Overheat protector
R1
R2
3
IN
2
COM
1
OUT

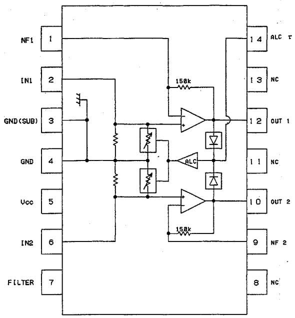
■ BA6417F-X [ROHM]
(Reversible Motor Driver)


RIN
VREF
OUT2
GND
FIN
Vcc
VM
OUT1

Top view

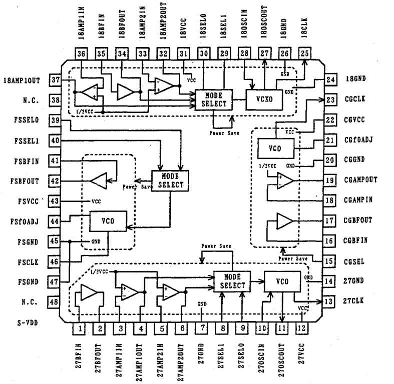

Vcc
3
VREF
6
VM
2
POWER SAVE
5
RIN
4
FIN
CONTROL LOGIC
DRIVER
DRIVER
1
OUT1
7
OUT2
M
T.S.D.
8
GND

■ BA3314F-X [ROHM]
(Dual Pre-Amp.for Audio Signal)

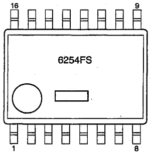

NF1 1
IN1 2
GND(SUB) 3
GND 4
Vcc 5
IN2 6
FILTER 7
14 ALC τ
13 NC
12 OUT 1
11 NC
10 OUT 2
9 NF 2
8 NC
150k
150k
ALC

(Top View)

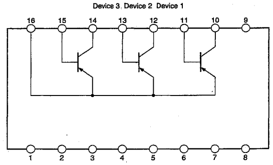
■ BH7086KV [ROHM]
(4 Channel VCO for DVC format)


18AMP1IN 36
18BFIN 35
18BFOUT 34
18AMP2IN 33
18AMP2OUT 32
18VCC 31
18SEL0 30
18SEL1 29
18OSCIN 28
18OSCOUT 27
18GND 26
18CLK 25
18AMP1OUT 37
N.C. 38
FSSEL0 39
FSSEL1 40
FSBFIN 41
FSBFOUT 42
FSVCC 43
FSf0ADJ 44
FSGND 45
FSCLK 46
FSGND 47
N.C. 48
S-VDD
24 18GND
23 CGCLK
22 CGVCC
21 CGf0ADJ
20 CGGND
19 CGAMPOUT
18 CGAMPIN
17 CGBFOUT
16 CGBFIN
15 CGSEL
14 27GND
13 27CLK
1 27BFIN
2 27BFOUT
3 27AMP1IN
4 27AMP1OUT
5 27AMP2IN
6 27AMP2OUT
7 27GND
8 27SEL1
9 27SEL0
10 27OSCIN
11 27OSCOUT
12 27VCC
MODE SELECT
VCXO
VCO
MODE SELECT
VCO
MODE SELECT
VCO
1/2VCC
VCC
GND
Power Save

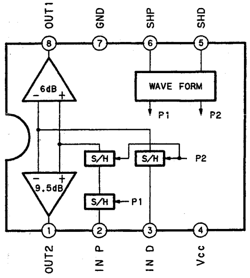
■ BA6254FS-X [ROHM]
(Motor Driver)


16
9
6254FS
1
8

(Top View)

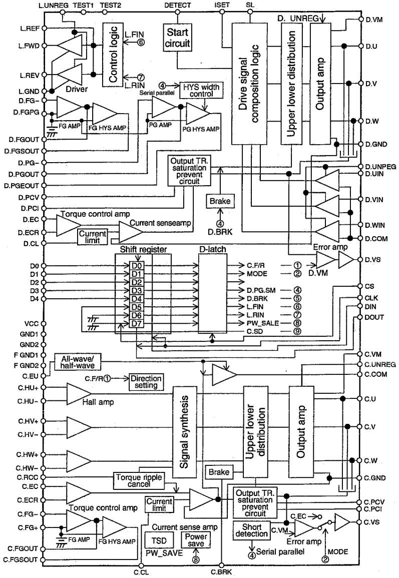

Device 3
Device 2
Device 1
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8

■ CXA1439M-X [SONY]
(Correlated Double Sampling)


OUT1
GND
SHP
SHD
8
7
6
5
6dB
WAVE FORM
P1
P2
S/H
S/H
P2
9.5dB
S/H
P1
1
2
3
4
OUT2
IN P
IN D
Vcc

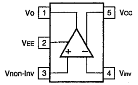
4-69

■ BA6865KV [ROHM]
(Motor Driver Controller)



L.UNREG
TEST1
TEST2
DETECT
ISET
SL
D. UNREG
D.VM
L.REF
L.FWD
L.REV
L.GND
D.FG-
D.FGPG
Driver
Control logic
L.FIN ⑥
L.RIN ⑦
Start circuit
④ HYS width control
Serial parallel
FG AMP
FG HYS AMP
PG AMP
PG HYS AMP
Drive signal composition logic
Upper lower distribution
Output amp
D.U
D.V
D.W
D.GND
D.FGOUT
D.FGSOUT
D.PG-
D.PGOUT
D.PGEOUT
D.PCV
D.PCI
D.EC
D.ECR
D.CL
Output TR. saturation prevent circuit
Brake
④ D.BRK
D.UNPEG
D.UIN
D.VIN
D.WIN
D.COM
D.VS
Torque control amp
Current senseamp
Current limit
Error amp
Shift register
D-latch
D0
D1
D2
D3
D4
D5
D6
D7
C.F/R ①
MODE ② D.VM
D.PG.SM ④
D.BRK ⑤
L.FIN ⑥
L.RIN ⑦
PW_SALE ⑧
C.SD ⑨
CS
CLK
DIN
DOUT
VCC
GND1
GND2
F GND1
F GND2
C.EU
C.HU+
C.HU-
C.HV+
C.HV-
C.HW+
C.HW-
C.RCC
C.EC
C.ECR
C.FG-
C.FG+
C.FGOUT
C.FGSOUT
All-wave/ half-wave
C.F/R①
Direction setting
Hall amp
Signal synthesis
Upper lower distribution
Output amp
C.VM
C.UNREG
C.COM
C.U
C.V
C.W
C.GND
Torque ripple cancel
Brake
Current limit
Torque control amp
Output TR. saturation prevent circuit
C.PCV
C.PCI
C.VS
C.EC
C.VM
Short detection
Error amp
Current sense amp
FG AMP
FG HYS AMP
TSD
Power save
PW_SAVE ⑧
④ Serial parallel
MODE ②
C.CL
C.BRK

■ CLC450AJM5-X [NATIONAL SEMICONDUCTOR]
(Current Feedback Amplifier)

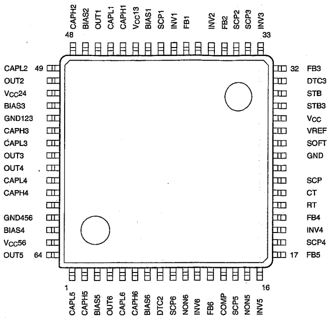


Vo 1
VEE 2
Vnon-Inv 3
5 Vcc
4 VInv
+
−

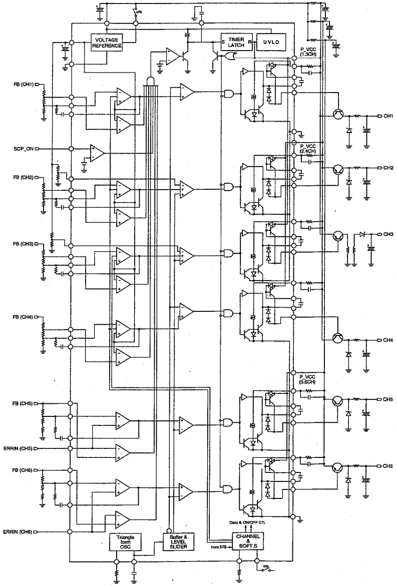
Top View

■ BA9738KV [ROHM]
(6 Channel Switching Regurator Controller)

(Top View)



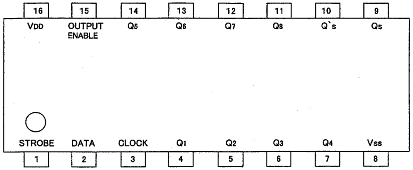
CAPH2
BIAS2
OUT1
CAPL1
CAPH1
Vcc13
BIAS1
SCP1
INV1
FB1
INV2
FB2
SCP2
SCP3
INV3
48
33
CAPL2 49
OUT2
Vcc24
BIAS3
GND123
CAPH3
CAPL3
OUT3
OUT4
CAPL4
CAPH4
GND456
BIAS4
Vcc56
OUT5 64
32 FB3
DTC3
STB
STB3
Vcc
VREF
SOFT
GND
SCP
CT
RT
FB4
INV4
SCP4
17 FB5
1
16
CAPL5
CAPH5
BIAS5
OUT6
CAPL6
CAPH6
BIAS6
DTC2
SCP6
NON6
INV6
FB6
COMP
SCP5
NON5
INV5



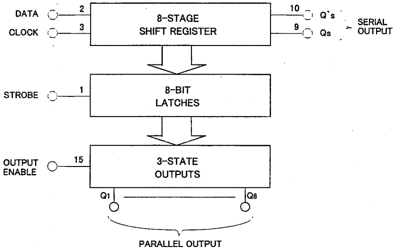
VOLTAGE REFERENCE
TIMER LATCH
UVLO
P_VCC (1.3CH)
P_VCC (2.4CH)
P_VCC (5.6CH)
FB (CH1)
SCP_ON
FB (CH2)
FB (CH3)
FB (CH4)
FB (CH5)
ERRIN (CH5)
FB (CH6)
ERRIN (CH6)
CH1
CH2
CH3
CH4
CH5
CH6
Triangle form OSC
Buffer & LEVEL SLIDER
Data & ON/OFF CTL
CHANNEL & SOFT.S
from STB

■ BU4094BCFV-X [ROHM]
(8-Stage Shift/Store Register)

(Top View)



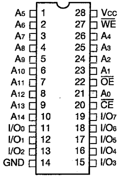
16
15
14
13
12
11
10
9
VDD
OUTPUT ENABLE
Q5
Q6
Q7
Q8
Q`s
Qs
STROBE
DATA
CLOCK
Q1
Q2
Q3
Q4
Vss
1
2
3
4
5
6
7
8



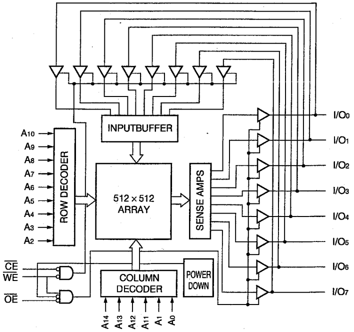
DATA
CLOCK
2
3
8-STAGE SHIFT REGISTER
10
9
Q`s
Qs
SERIAL OUTPUT
STROBE
1
8-BIT LATCHES
OUTPUT ENABLE
15
3-STATE OUTPUTS
Q1
Q8
PARALLEL OUTPUT

■ CY62256LL70SN-X [CYPRESS]
(32k x 8 Static RAM)

Top View

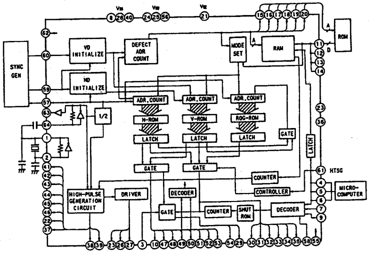


A5 1
A6 2
A7 3
A8 4
A9 5
A10 6
A11 7
A12 8
A13 9
A14 10
I/O0 11
I/O1 12
I/O2 13
GND 14
28 Vcc
27 WE
26 A4
25 A3
24 A2
23 A1
22 OE
21 A0
20 CE
19 I/O7
18 I/O6
17 I/O5
16 I/O4
15 I/O3



INPUTBUFFER
A10
A9
A8
A7
A6
A5
A4
A3
A2
ROW DECODER
512 × 512 ARRAY
SENSE AMPS
I/O0
I/O1
I/O2
I/O3
I/O4
I/O5
I/O6
I/O7
CE
WE
OE
COLUMN DECODER
POWER DOWN
A14
A13
A12
A11
A1
A0

■ CXD1265R [SONY]
(CCD Camera Timing Generator)



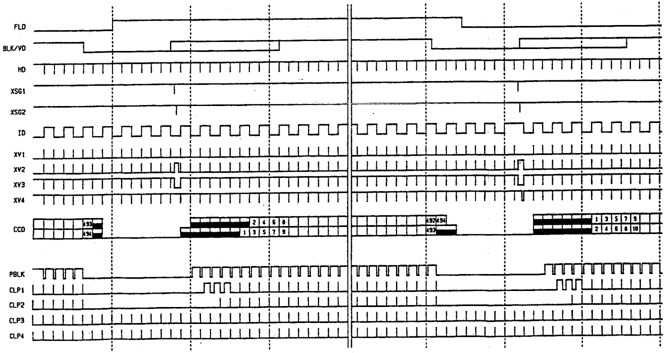
Pin Description

Pin No.	Symbol	I/O	Description
1	OSCO	O	Inverter output for oscillation.
2	OSCI	I	Inverter input for oscillation.
3	EF	I	Input mode select for defect compensation data. (With pull-up resistance) High: External ROM used, Low: Serial input from microcomputer
4	ED0	I	Shutter speed setting. Strobe input for serial mode. (With pull-up resistance)
5	ED1	I	Shutter speed setting. Clock input for serial mode. (With pull-up resistance)
6	ED2	I	Shutter speed setting. Data input for serial mode. (With pull-up resistance)
7	SMD1	I	Shutter mode setting. (With pull-up resistance)
8	Vss	–	GND
9	SMD2	I	Shutter mode setting. (With pull-up resistance)
10	XVCT	O	External ROM power supply control.
11	D1	I	When using external ROM, data input. (With pull-down resistance) When not using, Low: No defect compensation; High: Defect compensation enabled.
12	D2	I	When using external ROM, data input. (With pull-down resistance) When not using, Low: Color; High: Black-and-white.
13	D3	I	When using external ROM, data input. (With pull-down resistance) When not using, fixed at Low.
14	D4	I	When using external ROM, data input. (With pull-down resistance) When not using, Low: NTSC; High: PAL.
15	A5	O	External ROM address output.
16	A4	O	External ROM address output.
17	A3	O	External ROM address output.
18	A0	O	External ROM address output.
19	A1	O	External ROM address output.
20	A2	O	External ROM address output.
21	VEE	–	GND
22	RG	O	Reset gate pulse output.
23	LH1	–	CCD horizontal register final-step clock output.
24	VDD	–	Power supply.
25	VDP	–	Power supply for H1 and H2.
26	H1	O	Clock output for CCD horizontal register.
27	H2	O	Clock output for CCD horizontal register.
28	Vss	–	GND for H1 and H2.
29	XSUB	O	CCD discharge pulse output.
30	XV2	O	Clock output for CCD vertical register.
31	XV1	O	Clock output for CCD vertical register.
32	XSG1	O	CCD sensor charge readout pulse output.
33	XV3	O	Clock output for CCD vertical register.
34	XSG2	O	CCD sensor charge readout pulse output.
35	XV4	O	Clock output for CCD vertical register.
36	TEST2	I	Test input. Set Low in normal operation.
37	CLD	O	4 fsc clock output.
38	XSHP	O	Pulse for sample-and-hold of pre-charge level.
39	XSHD	O	Data sample-and-hold pulse.
40	Vss	–	GND

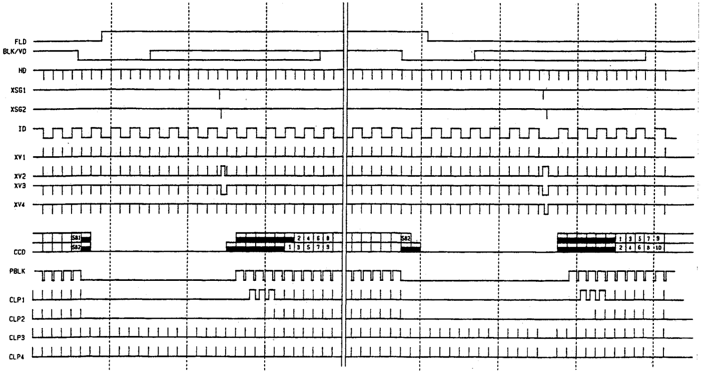
Pin Description

Pin No.	Symbol	I/O	Description
41	XSP1	O	Color separation sample-and-hold pulse. Halted for black-and-white mode.
42	XSP2	O	Color separation sample-and-hold pulse. Halted for black-and-white mode.
43	XSH1/ SHP	O	Switching sample-and-hold pulse/pre-charge level sample-and-hold pulse (black-and-white mode)
44	XSH2/ SHD	O	Switching sample-and-hold pulse/data sample-and-hold pulse (black-and-white mode)
45	XDL1	O	Delay line clock output. Halted for black-and-white mode.
46	XDL2	O	Delay line clock output. Halted for black-and-white mode.
47	BFG	O	Pulse output for chroma modulator in encoder. When GM is set at High, defect indicator pulse output. Halted for black-and-white mode.
48	CLP1	O	Clamp pulse output.
49	CLP2	IO	Clamp pulse output. When GM is set at High, standby mode switching input.
50	CLP3	IO	Clamp pulse output. When GM is set at High, standby mode switching input.
51	CLP4	O	Clamp pulse output.
52	PBLK	O	Blanking cleaning pulse output.
53	ID	O	Line identification output. Halted for black-and-white mode.
54	WEN	O	Write enable output for low-speed shutter operation.
55	GM	I	Low: Analog signal processing; High: Digital signal processing. (With pull-down resistance)
56	VDD	–	Power supply.
57	CL	O	4 fsc clock output.
58	PS	I	Switching for electronic shutter speed input method. (With pull-up resistance)Low: Serial input; High: Parallel input
59	HD	I	Horizontal synchronizing signal input.
60	VD	I	Vertical synchronizing signal input. (Low period is 9H for NTSC/EIA and 7.5H for PAL/CCIR.)
61	HTSG	I	Control input for XSG1and XSG2. (With pull-up resistance) Low: XSG1, XSG2 halted; High: XSG1, XSG2 generated.
62	TEST	I	Test input. Set at Low during normal operation. (With pull-down resistance)
63	XCK	O	8 fsc clock output.
64	CK	I	8 fsc clock input

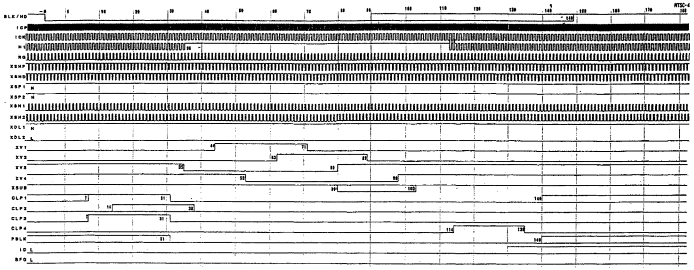
Time Chart (1) < NTSC vertical direction > (However, ID halted for black-and-white mode)



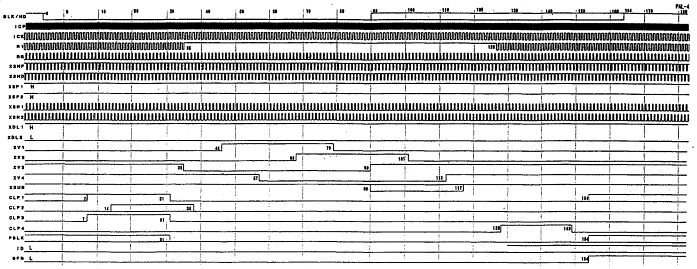
Time Chart (2) **< PAL vertical direction >** (However, ID halted for black-and-white mode)


FLD
BLK/VD
HD
XSG1
XSG2
ID
XV1
XV2
XV3
XV4
SB1
SB2
CCD
PBLK
CLP1
CLP2
CLP3
CLP4

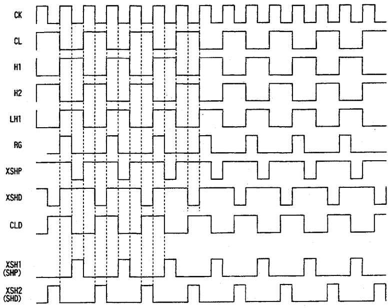
Time Chart **< NTSC horizontal direction >** (GM=L, D2=H, TEST2=L)


NTSC-4
BLK/HD
ICP
ICK
H1
RG
XSHP
XSHD
XSP1 H
XSP2 H
XSH1
XSH2
XDL1 H
XDL2 L
XV1
XV2
XV3
XV4
XSUB
CLP1
CLP2
CLP3
CLP4
PBLK
ID L
BFG L

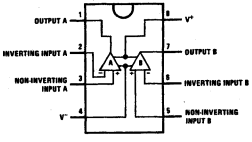
Time Chart **< PAL horizontal direction >** (GM=L, D2=H, TEST2=L)


PAL-4
BLK/HD
ICP
ICK
H1
RG
XSHP
XSHD
XSP1 H
XSP2 H
XSH1
XSH2
XDL1 H
XDL2 L
XV1
XV2
XV3
XV4
XSUB
CLP1
CLP2
CLP3
CLP4
PBLK
ID L
BFG L

Time Chart **< High speed phase >**

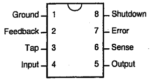

CK
CL
H1
H2
LH1
RG
XSHP
XSHD
CLD
XSH1 (SHP)
XSH2 (SHD)

■ LMC6082IM-X [National Semiconductor] (Precision CMOS Dual Op.Amp.)

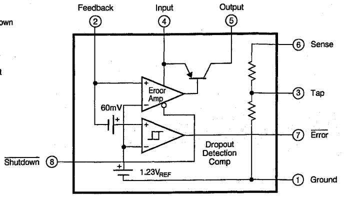

OUTPUT A
INVERTING INPUT A
NON-INVERTING INPUT A
V⁻
V⁺
OUTPUT B
INVERTING INPUT B
NON-INVERTING INPUT B
A
B
1
2
3
4
5
6
7
8

Top View

■ LP2986IMM-X [NATIONAL SEMICONDUCTOR] (Adjustable Voltage Regulator)

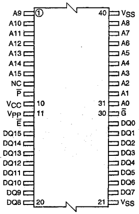

Ground 1
Feedback 2
Tap 3
Input 4
8 Shutdown
7 Error
6 Sense
5 Output

Top View


Feedback ②
Input ④
Output ⑤
⑥ Sense
③ Tap
⑦ Error
① Ground
Shutdown ⑧
Eroor Amp
60mV
Dropout Detection Comp
1.23V REF

■ M27W102-80N6-02 [ST MICRO ELECTRONICS] (1M Bit (64kb x 16) EPROM)

(Top View)


A9 ① 40 VSS
A10 A8
A11 A7
A12 A6
A13 A5
A14 A4
A15 A3
NC A2
P̄ A1
VCC 10 31 A0
VPP 11 30 Ḡ
Ē DQ0
DQ15 DQ1
DQ14 DQ2
DQ13 DQ3
DQ12 DQ4
DQ11 DQ5
DQ10 DQ6
DQ9 DQ7
DQ8 20 21 VSS

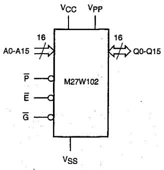
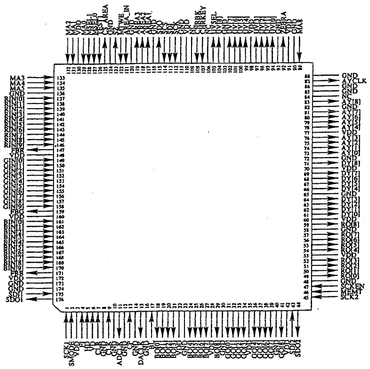

VCC
VPP
16
A0-A15
16
Q0-Q15
P̄
Ē
Ḡ
M27W102
VSS

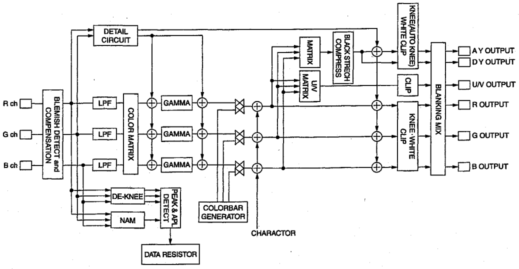
Table 1. Signal Names

A0-A15	Address Inputs
Q0-Q15	Data Outputs
Ē	Chip Enable
Ḡ	Output Enable
P̄	Program
V_{PP}	Program Supply
V_{CC}	Supply Voltage
V_{SS}	Ground

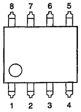
■ JCS0050 [JVC] (Digital Signal Processor)

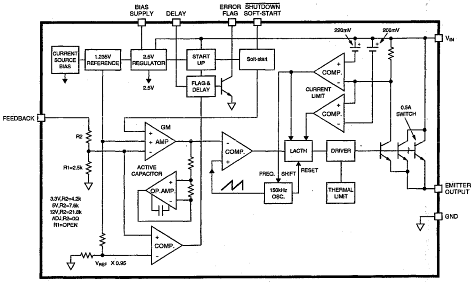
(Top View)


MA3
MA4
MA5
GND
RIN[0]
RIN[1]
RIN[2]
RIN[3]
RIN[4]
RIN[5]
RIN[6]
RIN[7]
RIN[8]
RIN[9]
FBR
VDD
GIN[0]
GIN[1]
GIN[2]
GIN[3]
GIN[4]
GIN[5]
GIN[6]
GIN[7]
GIN[8]
GIN[9]
FBG
VDD
BIN[0]
BIN[1]
BIN[2]
BIN[3]
BIN[4]
BIN[5]
BIN[6]
BIN[7]
BIN[8]
BIN[9]
FBB
VDD
GND
GND
SDI1
SDO1
GND
AYCLK
GND
GND
NC
AY[8]
GND
AY[7]
AY[6]
AY[5]
AY[4]
VDD
AY[3]
AY[2]
AY[1]
AY[0]
GND
DY[8]
VDD
DY[7]
DY[6]
DY[5]
DY[4]
GND
DY[3]
DY[2]
DY[1]
DY[0]
VDD
RO[8]
GND
RO[7]
RO[6]
RO[5]
RO[4]
VDD
RO[3]
RO[2]
RO[1]
RO[0]
GND
SCKEN
MEMT
SCK2
MA2
MA1
VDD
MA0
ZEBRA
MA8
SCK1
SMODE
SDI2
SDO2

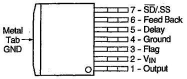

R ch
G ch
B ch
BLEMISH DETECT and COMPENSATION
DETAIL CIRCUIT
LPF
LPF
LPF
COLOR MATRIX
GAMMA
GAMMA
GAMMA
DE-KNEE
NAM
PEAK & APL DETECT
DATA RESISTOR
COLORBAR GENERATOR
CHARACTOR
MATRIX
U/V MATRIX
BLACK STRECH COMPRESS
KNEE(AUTO KNEE) WHITE CLIP
CLIP
KNEE WHITE CLIP
BLANKING MIX
A Y OUTPUT
D Y OUTPUT
U/V OUTPUT
R OUTPUT
G OUTPUT
B OUTPUT

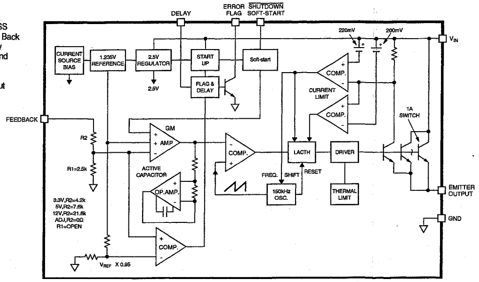
■ LM2597M-ADJ-X [NATIONAL SEMICONDUCTOR] (0.5A Step-Down Voltage Regulator)



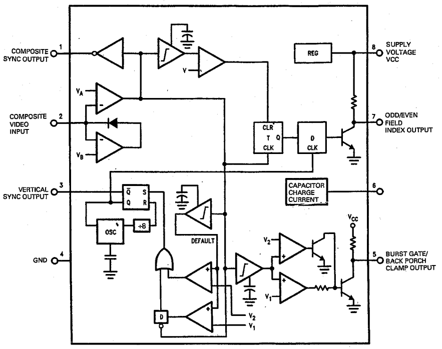

BIAS SUPPLY
DELAY
ERROR FLAG
SHUTDOWN SOFT-START
CURRENT SOURCE BIAS
1.235V REFERENCE
2.5V REGULATOR
2.5V
START UP
FLAG & DELAY
Soft-start
220mV
200mV
VIN
COMP.
CURRENT LIMIT
COMP.
0.5A SWITCH
FEEDBACK
R2
GM
AMP
ACTIVE CAPACITOR
OP.AMP.
R1=2.5k
COMP.
LACTH
DRIVER
FREQ. SHIFT
RESET
150kHz OSC.
THERMAL LIMIT
EMITTER OUTPUT
GND
3.3V,R2=4.2k
5V,R2=7.6k
12V,R2=21.8k
ADJ,R2=0Ω
R1=OPEN
COMP.
VREF X 0.95

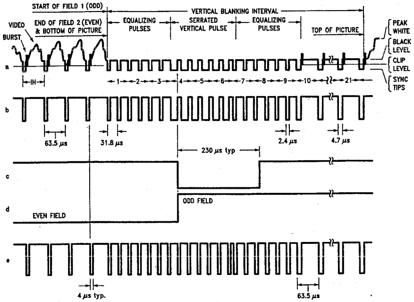
■ LM2598S-ADJ-X [NATIONAL SEMICONDUCTOR] (1A Step-Down Voltage Regulator)


Metal Tab GND
7 - SD/SS
6 - Feed Back
5 - Delay
4 - Ground
3 - Flag
2 - VIN
1 - Output


DELAY
ERROR FLAG
SHUTDOWN SOFT-START
CURRENT SOURCE BIAS
1.235V REFERENCE
2.5V REGULATOR
2.5V
START UP
FLAG & DELAY
Soft-start
220mV
200mV
VIN
COMP.
CURRENT LIMIT
COMP.
1A SWITCH
FEEDBACK
R2
GM
AMP
ACTIVE CAPACITOR
OP.AMP.
R1=2.5k
COMP.
LACTH
DRIVER
FREQ. SHIFT
RESET
150kHz OSC.
THERMAL LIMIT
EMITTER OUTPUT
GND
3.3V,R2=4.2k
5V,R2=7.6k
12V,R2=21.8k
ADJ,R2=0Ω
R1=OPEN
COMP.
VREF X 0.95

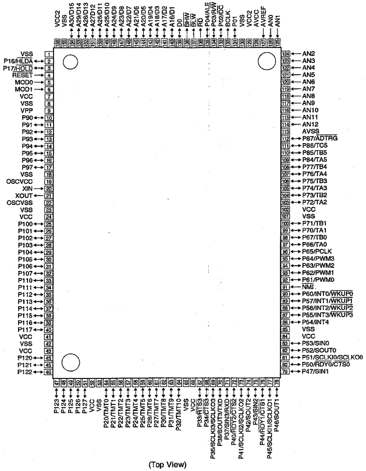
■ LM1881M-X [National Semiconductor] (Video Sync Separator)


COMPOSITE SYNC OUTPUT
1
COMPOSITE VIDEO INPUT
2
VERTICAL SYNC OUTPUT
3
GND
4
REG
SUPPLY VOLTAGE VCC
8
ODD/EVEN FIELD INDEX OUTPUT
7
CAPACITOR CHARGE CURRENT
6
BURST GATE/ BACK PORCH CLAMP OUTPUT
5
CLR
T Q
CLK
D
CLK
Q̄ S
Q R
OSC
÷8
DEFAULT
D
V
VA
VB
V2
V1
VCC

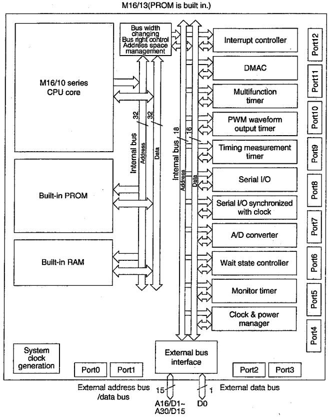

START OF FIELD 1 (ODD)
VERTICAL BLANKING INTERVAL
VIDEO
BURST
END OF FIELD 2 (EVEN) & BOTTOM OF PICTURE
EQUALIZING PULSES
SERRATED VERTICAL PULSE
EQUALIZING PULSES
TOP OF PICTURE
PEAK WHITE
BLACK LEVEL
CLIP LEVEL
SYNC TIPS
a
b
c
d
e
IH
1 2 3 4 5 6 7 8 9 10 21
63.5 µs
31.8 µs
2.4 µs
4.7 µs
230 µs typ
ODD FIELD
EVEN FIELD
4 µs typ.
63.5 µs

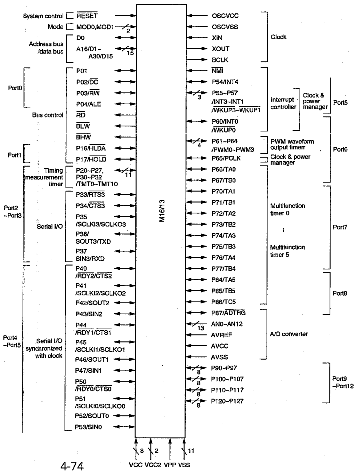
(a) Composite Video; (b) Composite Sync; (c) Vertical Output Pulse; (d) Odd/Even Field Index; (e) Burst Gate/Back Porch Clamp

■ M31020EAVP-101 [MITSUBISHI] (32bit Single Chip Micro Computer)

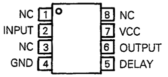

VSS 1
P16/HLDA 2
P17/HOLD 3
RESET 4
MOD0 5
MOD1 6
VCC 7
VSS 8
VPP 9
P90–P97 10–17
VSS 18
OSCVCC 19
XIN 20
XOUT 21
OSCVSS 22
VSS 23
VCC 24
P100–P107 25–32
P110–P117 33–40
VCC 41
VSS 42
VCC 43
P120–P122 44–46
P123 P124 P125 P126 P127 VCC VSS
P20/TMT0 P21/TMT1 P22/TMT2 P23/TMT3 P24/TMT4 P25/TMT5 P26/TMT6 P27/TMT7 P30/TMT8 P31/TMT9 P32/TMT10
VSS VCC
P33/RTS3 P34/CTS3 P35/SCLKI3/SCLKO3 P36/SOUT3/TXD P37/SIN3/RXD P40/RDY2/CTS2 P41/SCLKI2/SCLKO2 P42/SOUT2 P43/SIN2 P44/RDY1/CTS1 P45/SCLKI1/SCLKO1 P46/SOUT1
P47/SIN1 79
P50/RDY0/CTS0 80
P51/SCLKI0/SCLKO0 81
P52/SOUT0 82
P53/SIN0 83
VCC 84
VSS 85
P54/INT4 86
P55/INT3/WKUP3 87
P56/INT2/WKUP2 88
P57/INT1/WKUP1 89
P60/INT0/WKUP0 90
NMI 91
P61/PWM0 92
P62/PWM1 93
P63/PWM2 94
P64/PWM3 95
P65/PCLK 96
P66/TA0 97
P67/TB0 98
P70/TA1 99
P71/TB1 100
VSS 101
VCC 102
P72/TA2 103
P73/TB2 104
P74/TA3 105
P75/TB3 106
P76/TA4 107
P77/TB4 108
P84/TA5 109
P85/TB5 110
P86/TC5 111
P87/ADTRG 112
AVSS 113
AN12 114
AN11 115
AN10 116
AN9 117
AN8 118
AN7 119
AN6 120
AN5 121
AN4 122
AN3 123
AN2 124
VCC2 VSS A30/D15 A29/D14 A28/D13 A27/D12 A26/D11 A25/D10 A24/D9 A23/D8 A22/D7 A21/D6 A20/D5 A19/D4 A18/D3 A17/D2 A16/D1 D0 BHW BLW RD P04/ALE P03/RW P02/DC BCLK P01 VSS VCC2 AVCC AVREF AN0 AN1

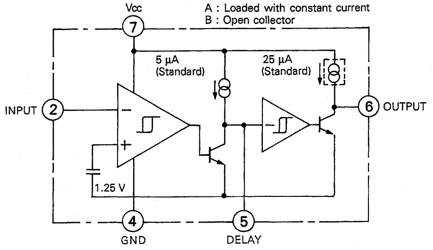
(Top View)


M16/13(PROM is built in.)
M16/10 series CPU core
Built-in PROM
Built-in RAM
Bus width changing Bus right control Address space management
Internal bus
Address
Data
32
32
18
16
Interrupt controller
DMAC
Multifunction timer
PWM waveform output timer
Timing measurement timer
Serial I/O
Serial I/O synchronized with clock
A/D converter
Wait state controller
Monitor timer
Clock & power manager
Port12
Port11
Port10
Port9
Port8
Port7
Port6
Port5
Port4
System clock generation
Port0
Port1
External bus interface
Port2
Port3
External address bus /data bus
15
A16/D1~ A30/D15
1
D0
External data bus

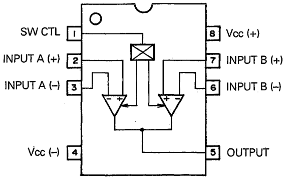

System control
RESET
Mode
MOD0,MOD1
2
Address bus /data bus
D0
A16/D1~ A30/D15
15
Port0
P01
P02/DC
P03/RW
P04/ALE
Bus control
RD
BLW
BHW
Port1
P16/HLDA
P17/HOLD
Timing measurement timer
P20~P27, P30~P32 /TMT0~TMT10
11
Port2 ~Port3
Serial I/O
P33/RTS3
P34/CTS3
P35 /SCLKI3/SCLKO3
P36/ SOUT3/TXD
P37 SIN3/RXD
Port4 ~Port5
Serial I/O synchronized with clock
P40 /RDY2/CTS2
P41 /SCLKI2/SCLKO2
P42/SOUT2
P43/SIN2
P44 /RDY1/CTS1
P45 /SCLKI1/SCLKO1
P46/SOUT1
P47/SIN1
P50 /RDY0/CTS0
P51 /SCLKI0/SCLKO0
P52/SOUT0
P53/SIN0
M16/13
OSCVCC
OSCVSS
XIN
XOUT
BCLK
Clock
NMI
P54/INT4
P55~P57 /INT3~INT1 /WKUP3~WKUP1
3
P60/INT0 /WKUP0
Interrupt controller
Clock & power manager
Port5
P61~P64 /PWM0~PWM3
4
P65/PCLK
PWM waveform output timer
Clock & power manager
Port6
P66/TA0
P67/TB0
P70/TA1
P71/TB1
P72/TA2
P73/TB2
P74/TA3
P75/TB3
P76/TA4
P77/TB4
P84/TA5
P85/TB5
P86/TC5
Multifunction timer 0
Multifunction timer 5
Port7
Port8
P87/ADTRG
AN0~AN12
13
AVREF
AVCC
AVSS
A/D converter
P90~P97
P100~P107
P110~P117
P120~P127
8
Port9 ~Port12
VCC VCC2 VPP VSS
8 2 11

■ M51957BFP-X [MITSUBISHI]
(Voltage Detector/System Reset)


NC 1
INPUT 2
NC 3
GND 4
8 NC
7 VCC
6 OUTPUT
5 DELAY

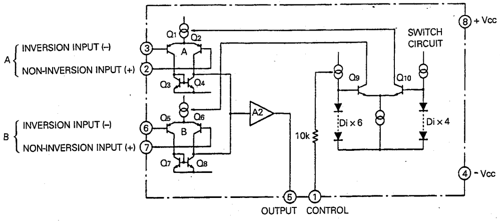

Vcc
A : Loaded with constant current
B : Open collector
7
5 µA
(Standard)
25 µA
(Standard)
INPUT 2
6 OUTPUT
1.25 V
4
GND
5
DELAY

■ M5201FP-X [MITSUBISHI]
(Switch Op.Amp.)

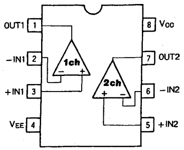

SW CTL 1
INPUT A (+) 2
INPUT A (–) 3
Vcc (–) 4
8 Vcc (+)
7 INPUT B (+)
6 INPUT B (–)
5 OUTPUT

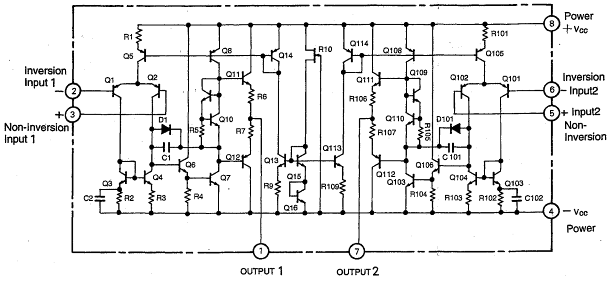
TRUE TABLE

SW CTL	OUTPUT
H	A
L	B

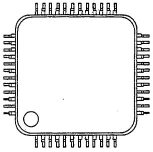

A
INVERSION INPUT (–)
NON-INVERSION INPUT (+)
B
INVERSION INPUT (–)
NON-INVERSION INPUT (+)
3
2
6
7
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
A2
10k
Di x 6
Di x 4
SWITCH CIRCUIT
8 + Vcc
4 - Vcc
5 OUTPUT
1 CONTROL

■ M5218AFP-X [MITSUBISHI]
(Dual Op.Amp.)


OUT1 1
–IN1 2
+IN1 3
VEE 4
1ch
2ch
8 Vcc
7 OUT2
6 –IN2
5 +IN2

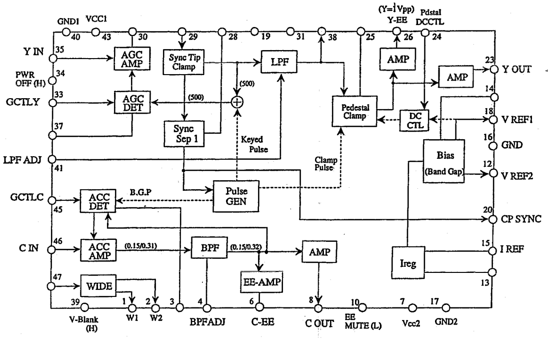

Inversion Input 1
Non-Inversion Input 1
2
3
8 Power +Vcc
6 Inversion – Input2
5 + Input2 Non-Inversion
4 – Vcc Power
R1
Q5
Q1
Q2
D1
C1
Q3
C2
R2
R3
R4
R5
Q4
Q6
Q7
Q8
Q11
Q10
Q12
R6
R7
Q14
R10
Q13
Q15
Q16
R9
R109
Q113
Q114
Q108
Q111
Q109
R106
R107
R105
Q110
Q112
Q103
Q106
D101
C101
Q102
Q101
R101
Q105
Q104
Q103
R104
R103
R102
C102
1
OUTPUT 1
7
OUTPUT 2

■ M52387FP [MITSUBISHI]
(Digital Signal Interface)

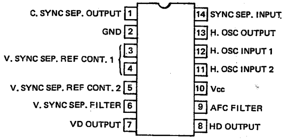


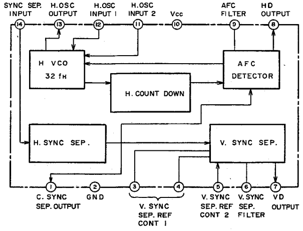
(Top View)

1. WIDE DET OUT1
2. WIDE DET OUT2
3. ACC FIL
4. BPF ADJ
5. NC
6. C-EE OUT
7. VCC2 (3V)
8. C-AD OUT
9. NC
10. EE MUTE
11. NC
12. VREF2
13. IREF FIL
14. VREF FIL
15. IREF
16. GND
17. GND2(C)
18. VREF1
19. GND3(PULSE)
20. CP SYNC OUT
21. NC
22. NC
23. Y-AD OUT
24. PED DC CTL
25. PED CLP FIL
26. Y-EE OUT
27. NC
28. SYNC SEP FIL
29. CLP IN
30. AGC OUT
31. VCC3(3V)
32. NC
33. AGC CTL
34. PWR OFF
35. Y IN
36. NC
37. AGC FIL
38. LPF MONI
39. VBLK IN
40. GND1(Y)
41. LPF ADJ
42. NC
43. VCC1(4.8V)
44. NC
45. ACC CTL
46. C IN
47. WIDE DET IN
48. NC

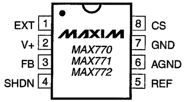

GND1
VCC1
(Y=1Vpp) Y-EE
Pdstal DCCTL
Y IN
PWR OFF (H)
GCTLY
LPF ADJ
GCTLC
C IN
AGC AMP
AGC DET
Sync Tip Clamp
Sync Sep 1
LPF
(500)
Keyed Pulse
Clamp Pulse
Pedestal Clamp
AMP
DC CTL
Bias (Band Gap)
Pulse GEN
B.G.P
ACC DET
ACC AMP
(0.15/0.31)
BPF
(0.15/0.32)
EE-AMP
AMP
Ireg
WIDE
Y OUT
V REF1
GND
V REF2
CP SYNC
I REF
V-Blank (H)
W1
W2
BPFADJ
C-EE
C OUT
EE MUTE (L)
Vcc2
GND2

■ M52684AFP-XE [MITSUBISHI]
(SYNC Separator and AFC)

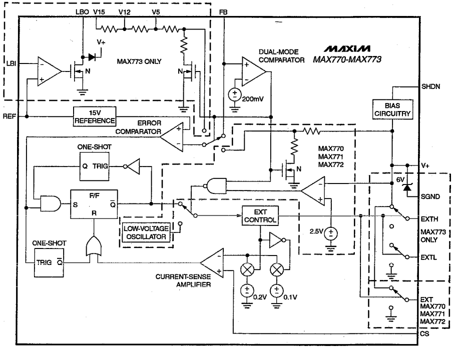

C. SYNC SEP. OUTPUT 1
GND 2
V. SYNC SEP. REF CONT. 1 3 4
V. SYNC SEP. REF CONT. 2 5
V. SYNC SEP. FILTER 6
VD OUTPUT 7
14 SYNC SEP. INPUT
13 H. OSC OUTPUT
12 H. OSC INPUT 1
11 H. OSC INPUT 2
10 Vcc
9 AFC FILTER
8 HD OUTPUT


SYNC SEP. INPUT
H.OSC OUTPUT
H.OSC INPUT 1
H.OSC INPUT 2
Vcc
AFC FILTER
HD OUTPUT
H VCO 32 fH
AFC DETECTOR
H. COUNT DOWN
H. SYNC SEP.
V. SYNC SEP.
C. SYNC SEP. OUTPUT
GND
V. SYNC SEP. REF CONT 1
V. SYNC SEP. REF CONT 2
V. SYNC SEP. FILTER
VD OUTPUT

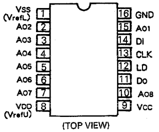
■ MAX771ESA-X [MAXIM]
(Stepup Switching Controller)


EXT 1
V+ 2
FB 3
SHDN 4
8 CS
7 GND
6 AGND
5 REF
MAXIM
MAX770
MAX771
MAX772

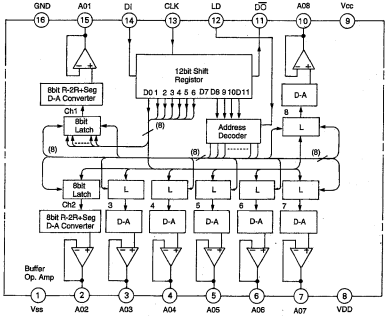
(Top View)


LBO V15 V12 V5
FB
LBI
V+
N
MAX773 ONLY
DUAL-MODE COMPARATOR
MAXIM
MAX770-MAX773
200mV
SHDN
BIAS CIRCUITRY
REF
1.5V REFERENCE
ERROR COMPARATOR
ONE-SHOT
Q TRIG
F/F
S Q
R
MAX770
MAX771
MAX772
V+
6V
SGND
EXTH
MAX773 ONLY
EXTL
EXT CONTROL
LOW-VOLTAGE OSCILLATOR
2.5V
ONE-SHOT
TRIG Q
CURRENT-SENSE AMPLIFIER
0.2V
0.1V
EXT
MAX770
MAX771
MAX772
CS

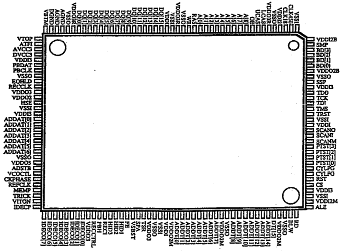
■ M62353GP-X [MITSUBISHI]
(8-Bit 8-Channel D/A Converter)


Vss (VrefL) 1
A02 2
A03 3
A04 4
A05 5
A06 6
A07 7
VDD (VrefU) 8
16 GND
15 A01
14 DI
13 CLK
12 LD
11 Do
10 A08
9 Vcc

(TOP VIEW)


GND 16
A01 15
DI 14
CLK 13
LD 12
DO 11
A08 10
Vcc 9
12bit Shift Register
D0 1 2 3 4 5 6 D7 D8 9 10 D11
8bit R-2R+Seg D-A Converter
Ch1
8bit Latch
Address Decoder
(8)
D-A
L
Ch2
Buffer Op. Amp
Vss 1
A02 2
A03 3
A04 4
A05 5
A06 6
A07 7
VDD 8

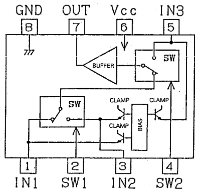
■ M65500FP [MITSUBISHI]
(Error Correcting Codes and Digital Channel Interface)



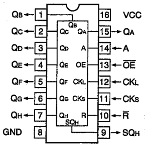
(Top View)

■ MAX772ESA-X [MAXIM]
(Refer to MAX771ESA-X.)

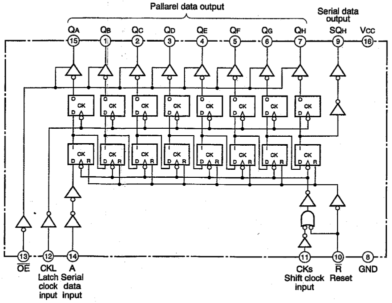
■ MM1117XF-X [MITSUMI]
(3 Input-1 Output Video Switch)


GND 8
OUT 7
Vcc 6
IN3 5
BUFFER
SW
CLAMP
BIAS
IN1 1
SW1 2
IN2 3
SW2 4

■ M66312FP-W [MITSUBISHI]
(8 Bit LED Driver with Shift Register and Latched 3-State Outputs)


QB 1
QC 2
QD 3
QE 4
QF 5
QG 6
QH 7
GND 8
16 VCC
15 QA
14 A
13 OE
12 CKL
11 CKs
10 R
9 SQH

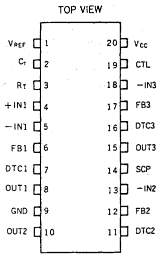
(Top View)

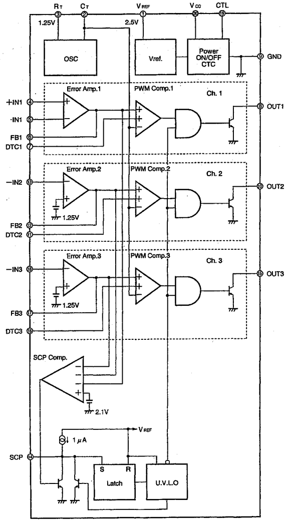

Pallarel data output
Serial data output
QA 15
QB 1
QC 2
QD 3
QE 4
QF 5
QG 6
QH 7
SQH 9
Vcc 16
CK
D
R
13 OE
12 CKL Latch clock input
14 A Serial data input
11 CKs Shift clock input
10 R Reset
8 GND

TRUTH TABLE

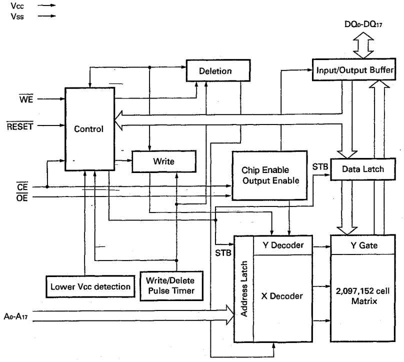
SW1	SW2	OUT
L	L	IN1
H	L	IN2
—	H	IN3

■ MB3782PF-X [FUJITSU]
(Switching Regulator Controller)

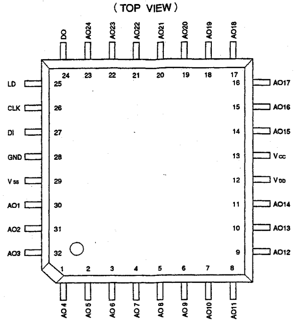

TOP VIEW
VREF 1
CT 2
RT 3
+IN1 4
−IN1 5
FB1 6
DTC1 7
OUT1 8
GND 9
OUT2 10
20 Vcc
19 CTL
18 −IN3
17 FB3
16 DTC3
15 OUT3
14 SCP
13 −IN2
12 FB2
11 DTC2

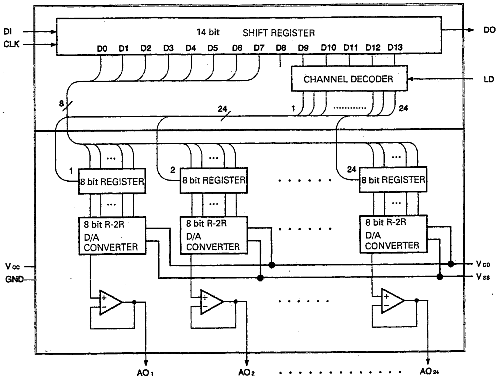

RT
CT
VREF
Vcc
CTL
1.25V
2.5V
OSC
Vref.
Power ON/OFF CTC
GND
Error Amp.1
PWM Comp.1
Ch. 1
OUT1
+IN1
-IN1
FB1
DTC1
Error Amp.2
PWM Comp.2
Ch. 2
OUT2
−IN2
1.25V
FB2
DTC2
Error Amp.3
PWM Comp.3
Ch. 3
OUT3
−IN3
1.25V
FB3
DTC3
SCP Comp.
2.1V
VREF
1 μA
SCP
S
R
Latch
U.V.L.O

■ PLSC1063 [FUJITSU]
(2M Bit Flash Memory)


Vcc
Vss
DQ0-DQ17
Deletion
Input/Output Buffer
WE
RESET
Control
Write
Chip Enable
Output Enable
STB
Data Latch
CE
OE
STB
Y Decoder
Y Gate
Address Latch
X Decoder
2,097,152 cell Matrix
Lower Vcc detection
Write/Delete Pulse Timer
A0-A17

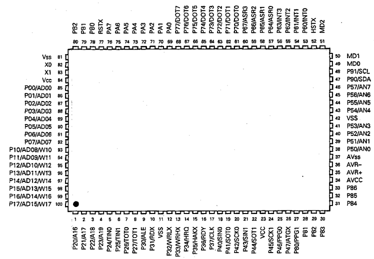
■ MB88345PF [FUJITSU]
(D/A Converter)

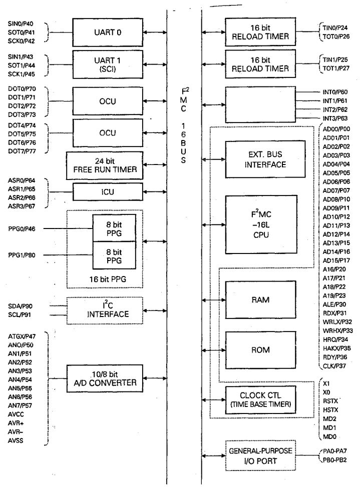

(TOP VIEW)
DO
AO24
AO23
AO22
AO21
AO20
AO19
AO18
LD
CLK
DI
GND
Vss
AO1
AO2
AO3
AO17
AO16
AO15
Vcc
VDD
AO14
AO13
AO12
AO4
AO5
AO6
AO7
AO8
AO9
AO10
AO11


DI
CLK
14 bit SHIFT REGISTER
D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13
DO
CHANNEL DECODER
LD
8
24
1
24
1
2
24
8 bit REGISTER
8 bit R-2R D/A CONVERTER
Vcc
GND
VDD
Vss
AO1
AO2
AO24

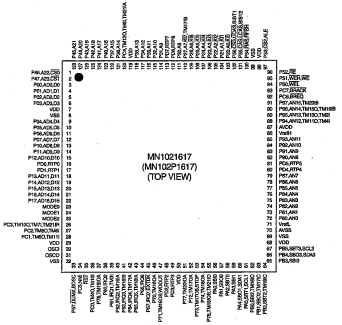
■ PLSC1278 [FUJITSU]
(Refer to PLSC1063.)

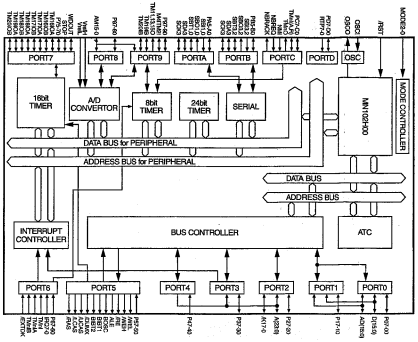
■ MB90T678BPF [MITSUBISHI]
(CPU)


PB2
PB1
PB0
RSTX
PA7
PA6
PA5
PA4
PA3
PA2
PA1
PA0
P77/DOT7
P76/DOT6
P75/DOT5
P74/DOT4
P73/DOT3
P72/DOT2
P71/DOT1
P70/DOT0
P67/ASR3
P66/ASR2
P65/ASR1
P64/ASR0
P63/INT3
P62/INT2
P61/INT1
P60/INT0
HSTX
MD2
Vss
X0
X1
Vcc
P00/AD00
P01/AD01
P02/AD02
P03/AD03
P04/AD04
P05/AD05
P06/AD06
P07/AD07
P10/AD08/W10
P11/AD09/W11
P12/AD10/W12
P13/AD11/W13
P14/AD12/W14
P15/AD13/W15
P16/AD14/W16
P17/AD15/W17
MD1
MD0
P91/SCL
P90/SDA
P57/AN7
P56/AN6
P55/AN5
P54/AN4
VSS
P53/AN3
P52/AN2
P51/AN1
P50/AN0
AVss
AVR−
AVR+
AVCC
P86
P85
P84
P20/A16
P21/A17
P22/A18
P23/A19
P24/TIN0
P25/TIN1
P26/TOT0
P27/TOT1
P30/ALE
P31/RDX
VSS
P32/WRLX
P33/WRHX
P34/HRQ
P35/HAKX
P36/RDY
P37/CLK
P40/SIN0
P41/SOT0
P42/SCK0
P43/SIN1
P44/SOT1
VCC
P45/SCK1
P46/PPG0
P47/ATGX
P80/PPG1
P81
P82
P83

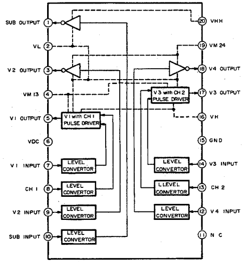

SIN0/P40
SOT0/P41
SCK0/P42
UART 0
SIN1/P43
SOT1/P44
SCK1/P45
UART 1 (SCI)
DOT0/P70
DOT1/P71
DOT2/P72
DOT3/P73
OCU
DOT4/P74
DOT5/P75
DOT6/P76
DOT7/P77
OCU
24 bit FREE RUN TIMER
ASR0/P64
ASR1/P65
ASR2/P66
ASR3/P67
ICU
PPG0/P46
8 bit PPG
PPG1/P80
8 bit PPG
16 bit PPG
SDA/P90
SCL/P91
I²C INTERFACE
ATGX/P47
AN0/P50
AN1/P51
AN2/P52
AN3/P53
AN4/P54
AN5/P55
AN6/P56
AN7/P57
AVCC
AVR+
AVR−
AVSS
10/8 bit A/D CONVERTER
F²MC 16 BUS
16 bit RELOAD TIMER
TIN0/P24
TOT0/P26
16 bit RELOAD TIMER
TIN1/P25
TOT1/P27
INT0/P60
INT1/P61
INT2/P62
INT3/P63
EXT. BUS INTERFACE
AD00/P00
AD01/P01
AD02/P02
AD03/P03
AD04/P04
AD05/P05
AD06/P06
AD07/P07
AD08/P10
AD09/P11
AD10/P12
AD11/P13
AD12/P14
AD13/P15
AD14/P16
AD15/P17
A16/P20
A17/P21
A18/P22
A19/P23
ALE/P30
RDX/P31
WRLX/P32
WRHX/P33
HRQ/P34
HAKX/P35
RDY/P36
CLK/P37
F²MC −16L CPU
RAM
ROM
CLOCK CTL (TIME BASE TIMER)
X1
X0
RSTX
HSTX
MD2
MD1
MD0
GENERAL-PURPOSE I/O PORT
PA0-PA7
PB0-PB2

■ MN102F1617HL-21 [MATSUSHITA]
(16 Bit Micro Controller)


MN1021617
(MN102P1617)
(TOP VIEW)
1 P46,A22,CS0
2 P47,A23,CS1
3 P00,AD0,D0
4 P01,AD1,D1
5 P02,AD2,D2
6 P03,AD3,D3
7 VDD
8 VSS
9 P04,AD4,D4
10 P05,AD5,D5
11 P06,AD6,D6
12 P07,AD7,D7
13 P10,AD8,D8
14 P11,AD9,D9
15 P12,AD10,D10
16 PD0,RTP0
17 PD1,RTP1
18 P13,AD11,D11
19 P14,AD12,D12
20 P15,AD13,D13
21 P16,AD14,D14
22 P17,AD15,D15
23 MODE0
24 MODE1
25 MODE2
26 PC3,TM10O,TM7I,TM21IR
27 PC2,TM8O,TM6I
28 PC1,TM6O,TM11I
29 VDD
30 OSCI
31 OSCO
32 VSS
33 P57,DUMX,BOSC
34 PC5,NMI
35 RST
36 PC0,TM4O,TM10I
37 P76,TM19IOA
38 P60,IRQ0
39 P61,IRQ1,TM3I
40 P62,IRQ2,TM16IA
41 P63,IRQ3,TM16IB
42 P64,IRQ4,TM17IA
43 P65,IRQ5,TM18IA
44 P66,IRQ6
45 P67,IRQ7,EXTDK
46 P70,TM16OA
47 P71,TM16OB,WDOUT
48 PD2,RTP2
49 PD3,RTP3
50 VDD
51 P77,TM20IOA
52 P72,TM17OA
53 P73,TM17OB,STOP
54 P74,TM18OA
55 P75,TM18IOB,TM21ID
56 PA0,SBI0
57 PA1,SBO0
58 PA2,SBT0
59 PA3,SBI1
60 PA4,SBO1,SDA1
61 PA5,SBT1,SCL1
62 PB0,SBI2,TM16IC
63 PB1,SBO2,TM17IC
64 PB2,SBT2,TM18IC
65 PB3,SBI3
66 PB4,SBO3,SDA3
67 PB5,SBT3,SCL3
68 VDD
69 VSS
70 AVSS
71 VrefL
72 P80,AN0
73 P81,AN1
74 P82,AN2
75 P83,AN3
76 P84,AN4
77 P85,AN5
78 P86,AN6
79 P87,AN7
80 PD4,RTP4
81 PD5,RTP5
82 P90,AN8
83 P91,AN9
84 P92,AN10
85 P93,AN11
86 VrefH
87 AVDD
88 P94,AN12,TM11O,TM4I
89 P95,AN13,TM13O,TM2I
90 P96,AN14,TM15O,TM19IB
91 P97,AN15,TM20IB
92 PC6,BREQ
93 PC7,BRACK
94 P50,WEL
95 P51,WEH,WE
96 P52,RE
97 P53,CS2,ALE
98 VDD
99 VSS
100 P54,RAS,RFSH
101 P55,CAS,LCAS,BIBT2
102 P56,CS3,UCAS,BIBT1
103 P20,A0,KI0
104 P21,A1,KI1
105 P22,A2,KI2
106 P23,A3,KI3
107 P24,A4,KI4
108 P25,A5,KI5
109 P26,A6,KI6
110 P27,A7,KI7,TM17IB
111 P30,A8
112 PD6,RTP6
113 PD7,RTP7
114 P31,A9
115 P32,A10
116 P33,A11
117 P34,A12
118 P35,A13
119 VDD
120 PC4,TM12O,TM8I,TM21IA
121 P36,A14
122 P37,A15
123 P40,A16
124 P41,A17
125 P42,A18
126 P43,A19
127 P44,A20
128 P45,A21

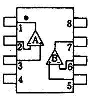

TM20IOB
TM19IOA
TM18IOB
TM18IOA
TM17IOB
TM17IOA
TM16IOB
TM16IOA
P75-70
STOP
WDOUT
VrefH
VrefL
AM15-0
P87-80
TM20IB
TM19IB
TM11,13,15O
M4ITM2I
P97-90
SCK3
SDA3
SBT1,0
SBO1,0
SBI1,0
PA5-A0
SCK3
SDA3
SBT3,2
SBO3,2
SBI3,2
PB5-B0
NBRACK
NBREQ
NMI
TMnO
TMnI(A,B)
PC7-C0
RTP7-0
PD7-D0
OSCO
OSCI
/RST
MODE2-0
PORT7
PORT8
PORT9
PORTA
PORTB
PORTC
PORTD
OSC
16bit TIMER
A/D CONVERTOR
8bit TIMER
24bit TIMER
SERIAL
MN102H00
MODE CONTROLLER
DATA BUS for PERIPHERAL
ADDRESS BUS for PERIPHERAL
DATA BUS
ADDRESS BUS
INTERRUPT CONTROLLER
BUS CONTROLLER
ATC
PORT6
PORT5
PORT4
PORT3
PORT2
PORT1
PORT0
/EXTDK
TMnIB
TMnIA
TMnI
IRQ7-0
P67-60
/RAS
/LCAS
/UCAS
/DUMX
BIBT2
BIBT1
BOSC
ALE
/RE
/WEH
/WEL
P57-50
P47-40
P37-30
/K17-0
A(23:0)
P27-20
P17-10
AD(15:0)
D(15:0)
P07-00

■ MN3112SA-X [MATSUSHITA]
(Vertical Driver)

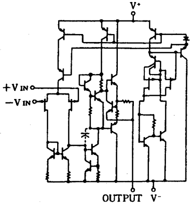

SUB OUTPUT ①
VL ②
V2 OUTPUT ③
VM 13 ④
V1 OUTPUT ⑤
VDC ⑥
V1 INPUT ⑦
CH 1 ⑧
V2 INPUT ⑨
SUB INPUT ⑩
⑪ N C
⑫ V4 INPUT
⑬ CH 2
⑭ V3 INPUT
⑮ GND
⑯ VH
⑰ V3 OUTPUT
⑱ V4 OUTPUT
⑲ VM 24
⑳ VHH
V1 with CH1 PULSE DRIVER
V3 with CH2 PULSE DRIVER
LEVEL CONVERTOR
LEVEL CONVERTOR
LEVEL CONVERTOR
LEVEL CONVERTOR
LEVEL CONVERTOR
LLEVEL CONVERTOR
LEVEL CONVERTOR

■ NJM062V-X [JRC]
(J-FET Input Op.Amp.)

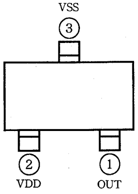
(Top View)

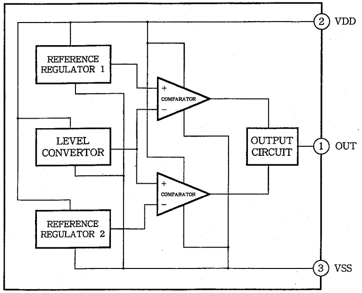

1
2
3
4
5
6
7
8
A
B

1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

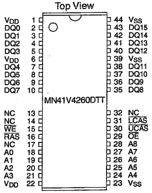

V⁺
+V IN
−V IN
OUTPUT
V⁻

■ MN12821-QR-X [MATSUSHITA]
(Voltage Detecter)

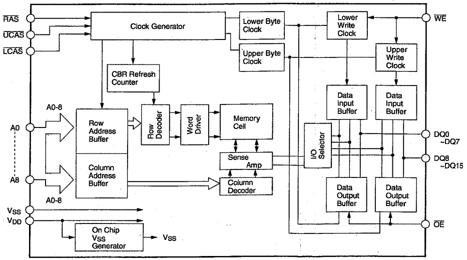

VSS
③
②
VDD
①
OUT


② VDD
REFERENCE REGULATOR 1
+
COMPARATOR
−
LEVEL CONVERTOR
OUTPUT CIRCUIT
① OUT
+
COMPARATOR
−
REFERENCE REGULATOR 2
③ VSS

■ MN41V4260TT-A07 [MATSUSHITA]
(4M(256k-word x 16bit)Dynamic RAM)

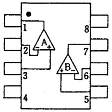

Top View
MN41V4260DTT
VDD 1
DQ0 2
DQ1 3
DQ2 4
DQ3 5
VDD 6
DQ4 7
DQ5 8
DQ6 9
DQ7 10
NC 13
NC 14
WE 15
RAS 16
NC 17
A0 18
A1 19
A2 20
A3 21
VDD 22
44 VSS
43 DQ15
42 DQ14
41 DQ13
40 DQ12
39 VSS
38 DQ11
37 DQ10
36 DQ9
35 DQ8
32 NC
31 LCAS
30 UCAS
29 OE
28 A8
27 A7
26 A6
25 A5
24 A4
23 VSS

BLOCK DIAGRAM

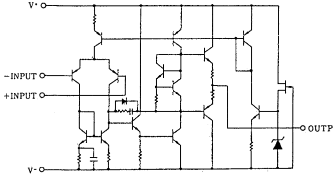

RAS
UCAS
LCAS
Clock Generator
Lower Byte Clock
Upper Byte Clock
Lower Write Clock
Upper Write Clock
WE
CBR Refresh Counter
A0-8
A0
A8
A0-8
Row Address Buffer
Column Address Buffer
Row Decoder
Word Driver
Memory Cell
Sense Amp
Column Decoder
I/O Selector
Data Input Buffer
Data Input Buffer
Data Output Buffer
Data Output Buffer
DQ0 ~DQ7
DQ8 ~DQ15
OE
VSS
VDD
On Chip VSS Generator
VSS

■ NJM2068M-D-X [JRC]
(Dual Low-Noise Op.Amp.)

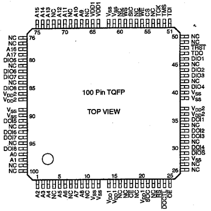
(Top View)


1
2
3
4
5
6
7
8
A
B

1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

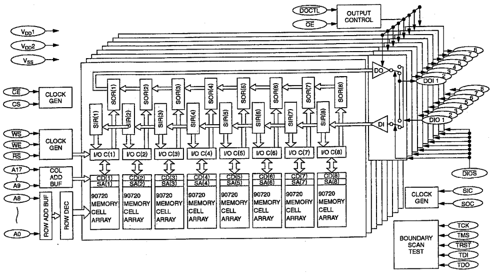

V⁺
−INPUT
+INPUT
OUTPUT
V⁻

■ MN47V06AF [MATSUSHITA]
(4.75Mbit (622080 word x 8bit) CMOS DRAM)


100 Pin TQFP
TOP VIEW

■ Pin Names

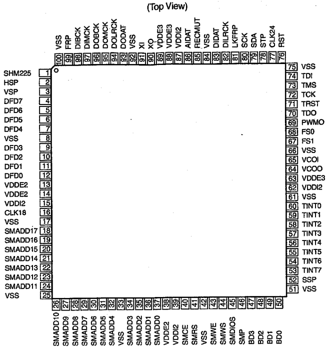
Symbol	Pin names	Symbol	Pin names
A0~A17	Address Inputs	$\overline{DIOS}$	Data Input/Output Select
$\overline{CE}$	Chip Enable	$\overline{DOCTL}$	Data Output Control
$\overline{OE}$	Output Enable	TCK	Boundary Scan Test Clock
$\overline{WE}$	Write Enable	TMS	Boundary Scan Test Mode Select
$\overline{WS}$	Write Strobe	$\overline{TRST}$	Boundary Scan Test Reset
$\overline{RS}$	Read Strobe	TDI	Boundary Scan Test Data Input
CS	Chip Select	TDO	Boundary Scan Test Data Output
SIC	Shift-in Clock	$V_{DD}1$	Internal Power Supply (2.7V~3.3V)
SOC	Shift-out Clock	$V_{DD}2$	I/F Power Supply (2.0V~V_{DD1}V)
DIO1~8	Data Input/Output	Vss	Power Supply (GND)
DOI1~8	Data Input/Output	NC	No Connection

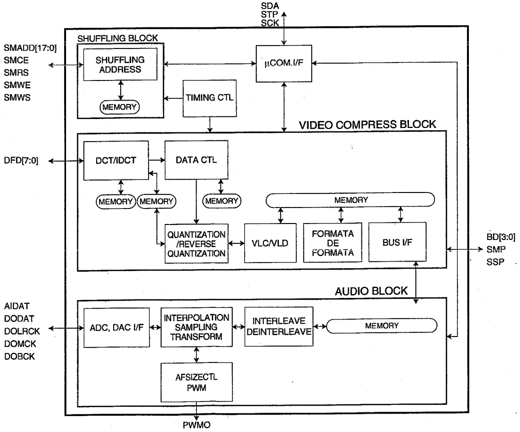

DOCTL
OE
OUTPUT CONTROL
VDD1
VDD2
VSS
CE
CS
CLOCK GEN
WS
WE
RS
CLOCK GEN
A17
A9
COL ADD BUF
A8
A0
ROW ADD BUF
ROW DEC
SOR(1)
SOR(2)
SOR(3)
SOR(4)
SOR(5)
SOR(6)
SOR(7)
SOR(8)
SIR(1)
SIR(2)
SIR(3)
SIR(4)
SIR(5)
SIR(6)
SIR(7)
SIR(8)
I/O C(1)
I/O C(2)
I/O C(3)
I/O C(4)
I/O C(5)
I/O C(6)
I/O C(7)
I/O C(8)
CD(1) SA(1)
CD(2) SA(2)
CD(3) SA(3)
CD(4) SA(4)
CD(5) SA(5)
CD(6) SA(6)
CD(7) SA(7)
CD(8) SA(8)
90720 MEMORY CELL ARRAY
DO
DI
DOI 1
DIO 1
DIOS
CLOCK GEN
SIC
SOC
BOUNDARY SCAN TEST
TCK
TMS
TRST
TDI
TDO

SIR : SHIFT IN REGISTER
CD : COLUMN DECODER
DO : DATA OUT BUFFER
SOR : SHIFT OUT REGISTER
SA : SENSE AMPLIFIER
I/O C : I/O CONTROLLER
DI : DATA IN BUFFER
CLOCK GEN : CLOCK GENERATOR
ROW ADD BUF : ROW ADDRESS BUFFER
COL ADD BUF : COLUMN ADDRESS BUFFER
ROW DEC : ROW DECODER

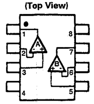
■ MN67373 [MATSUSHITA]
(Video Compress and Audio DSP at DV Format)

(Top View)


1 SHM225
2 HSP
3 VSP
4 DFD7
5 DFD6
6 DFD5
7 DFD4
8 VSS
9 DFD3
10 DFD2
11 DFD1
12 DFD0
13 VDDE2
14 VDDE2
15 VDDI2
16 CLK18
17 VSS
18 SMADD17
19 SMADD16
20 SMADD15
21 SMADD14
22 SMADD13
23 SMADD12
24 SMADD11
25 VSS
26 SMADD10
27 SMADD9
28 SMADD8
29 SMADD7
30 SMADD6
31 SMADD5
32 SMADD4
33 VSS
34 SMADD3
35 SMADD2
36 SMADD1
37 SMADD0
38 VDDE2
39 VDDI2
40 SMCE
41 SMRS
42 VSS
43 SMWE
44 SMWS
45 SMDIOS
46 SMP
47 BD3
48 BD2
49 BD1
50 BD0
51 VSS
52 SSP
53 TINT7
54 TINT6
55 TINT5
56 TINT4
57 TINT3
58 TINT2
59 TINT1
60 TINT0
61 VSS
62 VDDI2
63 VDDE3
64 VCOO
65 VCOI
66 VSS
67 FS1
68 FS0
69 PWMO
70 TDO
71 TRST
72 TCK
73 TMS
74 TDI
75 VSS
76 RST
77 CLK24
78 STP
79 SDA
80 SCK
81 LKFRP
82 DILRCK
83 DIDAT
84 VSS
85 RECMUT
86 AIDAT
87 VDDI2
88 VDDE3
89 VDDE3
90 XO
91 XI
92 VSS
93 DODAT
94 DOLRCK
95 DOMCK
96 DOBCK
97 DIMCK
98 DIBCK
99 FRP
100 VSS


SDA
STP
SCK
SMADD[17:0]
SMCE
SMRS
SMWE
SMWS
SHUFFLING BLOCK
SHUFFLING ADDRESS
MEMORY
μCOM.I/F
TIMING CTL
VIDEO COMPRESS BLOCK
DFD[7:0]
DCT/IDCT
DATA CTL
MEMORY
MEMORY
MEMORY
MEMORY
QUANTIZATION /REVERSE QUANTIZATION
VLC/VLD
FORMATA DE FORMATA
BUS I/F
BD[3:0]
SMP
SSP
AUDIO BLOCK
AIDAT
DODAT
DOLRCK
DOMCK
DOBCK
ADC, DAC I/F
INTERPOLATION SAMPLING TRANSFORM
INTERLEAVE DEINTERLEAVE
MEMORY
AFSIZECTL PWM
PWMO

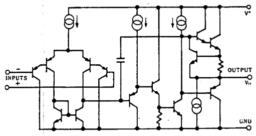
■ NJM2904M-X [JRC]
(Dual Op.Amp.)


(Top View)
1
2
3
4
5
6
7
8
A
B

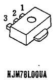
Pin Assignment

1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. GND
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

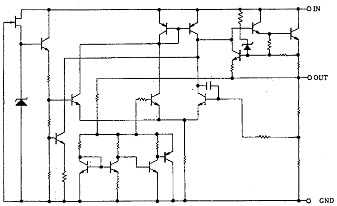
■ Equivalent Circuit (2 circuits in a chip)


V⁺
INPUTS
OUTPUT
GND

■ NJM78L05UA-X [JRC]
(3-Terminal Positive Voltage Regulator (+5V))


3
2
1
NJM78L0UA

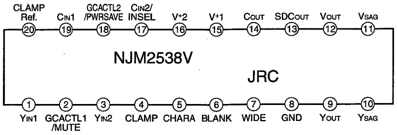
1. OUT
2. GND
3. IN

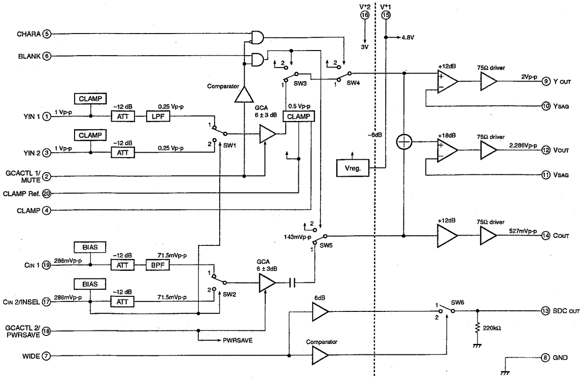


■ NJM78L15UA-X [JRC]
(Refer to NJM78L05UA-X.)

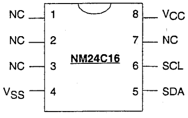
■ NJM2538V-X [JRC]
(Video Amp.)

(Top View)

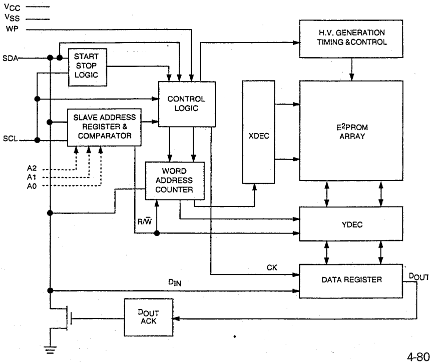

CLAMP Ref.
CIN1
GCACTL2 /PWRSAVE
CIN2/ INSEL
V+2
V+1
COUT
SDCOUT
VOUT
VSAG
NJM2538V
JRC
YIN1
GCACTL1 /MUTE
YIN2
CLAMP
CHARA
BLANK
WIDE
GND
YOUT
YSAG


CHARA
BLANK
YIN 1
YIN 2
GCACTL 1/ MUTE
CLAMP Ref.
CLAMP
CIN 1
CIN 2/INSEL
GCACTL 2/ PWRSAVE
WIDE
Comparator
CLAMP
ATT
LPF
BIAS
BPF
GCA
SW1
SW2
SW3
SW4
SW5
SW6
Vreg.
75Ω driver
Y OUT
YSAG
VOUT
COUT
SDC OUT
GND
PWRSAVE
220kΩ
4.8V
3V

■ NM24C16LEM8-X [FAIRCHILD]
(16,384bit Standard 2-Wire Bus Interface Serial EEPROM)

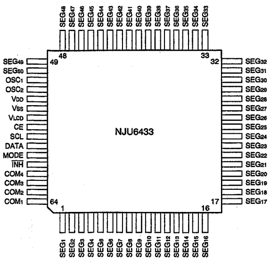

NC 1
NC 2
NC 3
VSS 4
8 VCC
7 NC
6 SCL
5 SDA
NM24C16

Top View


VCC
VSS
WP
SDA
SCL
A2
A1
A0
START STOP LOGIC
SLAVE ADDRESS REGISTER & COMPARATOR
CONTROL LOGIC
WORD ADDRESS COUNTER
R/W
XDEC
H.V. GENERATION TIMING &CONTROL
E2PROM ARRAY
YDEC
CK
DATA REGISTER
DIN
DOUT
DOUT ACK

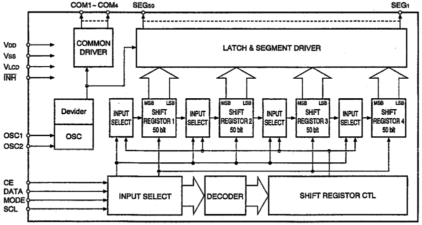
■ NM24C16LEM8-XZB [FAIRCHILD]
(Refer to NM24C16LEM8-X)

■ NJU6433FB2 [JRC]
(1/4 Duty LCD Driver)


SEG48 … SEG33
SEG49
SEG50
OSC1
OSC2
VDD
VSS
VLCD
CE
SCL
DATA
MODE
INH
COM4
COM3
COM2
COM1
SEG32 … SEG17
SEG1 … SEG16
NJU6433
48
33
49
32
64
1
16
17

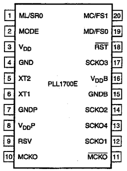
(TOP VIEW)

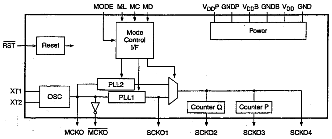
No.	Symbol	Function
1~50	SEG1~SEG50	Segment output for LCD driver
51 52	OSC1 OSC2	OSC terminal
53	VDD	
54	VSS	GND
55	VLCD	Power source for LCD drive
56	CE	H level : Data input Drop-down edge : Data latch L level : Disable
57	SCL	Clock input for serial data trancefar.
58	DATA	Serial data input.
59	MODE	H level : Mode seting L level : Data input for LCD display
60	INH	L level : LCD is not display H level : LCD is display
61~64	COM4~COM1	Common output for LCD drive.


COM1~COM4
SEG50
SEG1
VDD
VSS
VLCD
INH
COMMON DRIVER
LATCH & SEGMENT DRIVER
Devider
OSC
OSC1
OSC2
INPUT SELECT
SHIFT REGISTOR 1 50 bit
SHIFT REGISTOR 2 50 bit
SHIFT REGISTOR 3 50 bit
SHIFT REGISTOR 4 50 bit
MSB
LSB
CE
DATA
MODE
SCL
INPUT SELECT
DECODER
SHIFT REGISTOR CTL

■ PLL1700E-X [BURR-BROWN]
(Programmable Dual PLL Clock Generator)

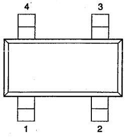
(Top View)


1 ML/SR0
2 MODE
3 VDD
4 GND
5 XT2
6 XT1
7 GNDP
8 VDDP
9 RSV
10 MCKO
20 MC/FS1
19 MD/FS0
18 RST
17 SCKO3
16 VDDB
15 GNDB
14 SCKO2
13 SCKO4
12 SCKO1
11 MCKO
PLL1700E

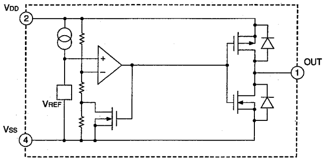

MODE
ML
MC
MD
VDDP
GNDP
VDDB
GNDB
VDD
GND
Power
RST
Reset
Mode Control I/F
XT1
XT2
OSC
PLL2
PLL1
Counter Q
Counter P
MCKO
MCKO
SCKO1
SCKO2
SCKO3
SCKO4

■ S-80840ANNP-W [SEIKO]
(Precision Voltage Detector)

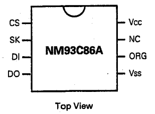
Top view



1 OUT
2 VDD
3 NC
4 VSS


VDD
2
VSS
4
VREF
OUT
1

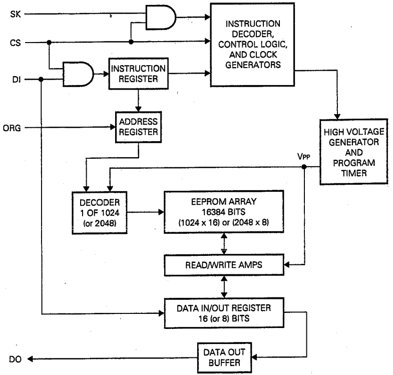
■ NM93C86AEM8-X [NATIONAL SEMICONDUCTOR] (16,384-Bit Serial Interface, Standard Voltage CMOS EEPROM)


CS
SK
DI
DO
NM93C86A
Vcc
NC
ORG
Vss
Top View

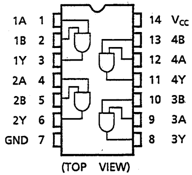
Pin Nane

Pin	Description
CS	Chip Select
SK	Serial Data Clock
DI	Serial Data Input
DO	Serial Data Output
VSS	Ground
ORG	Memory Organization Select (On the NM93C86A)
NC	No Connect
VCC	Positive Power Supply

Block Diagram


SK
CS
DI
ORG
DO
INSTRUCTION DECODER, CONTROL LOGIC, AND CLOCK GENERATORS
INSTRUCTION REGISTER
ADDRESS REGISTER
HIGH VOLTAGE GENERATOR AND PROGRAM TIMER
VPP
DECODER 1 OF 1024 (or 2048)
EEPROM ARRAY 16384 BITS (1024 x 16) or (2048 x 8)
READ/WRITE AMPS
DATA IN/OUT REGISTER 16 (or 8) BITS
DATA OUT BUFFER

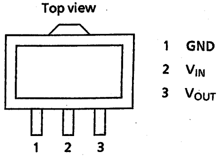
■ SN74LV08APW-X [TEXAS] (Quad 2-Input AND Gates)

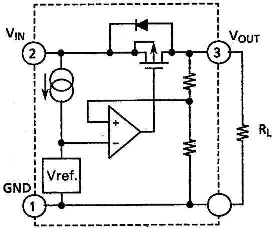

1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 Vcc
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y
(TOP VIEW)

TRUE Table

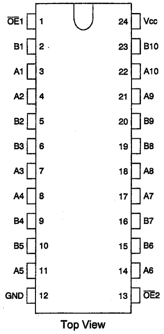
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

■ S-81240PG-PJ-X [SEIKO] (Voltage Regulator)


Top view
1 GND
2 V_{IN}
3 V_{OUT}
1 2 3

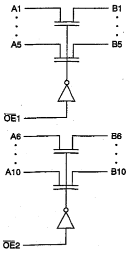

V_{IN}
2
V_{OUT}
3
+
-
R_L
Vref.
GND
1

■ SN74CBT3384APWX [TEXAS] (10 Bit Cross Bar Switch)

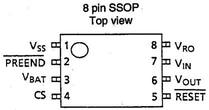

OE1 1
B1 2
A1 3
A2 4
B2 5
B3 6
A3 7
A4 8
B4 9
B5 10
A5 11
GND 12
24 Vcc
23 B10
22 A10
21 A9
20 B9
19 B8
18 A8
17 A7
16 B7
15 B6
14 A6
13 OE2
Top View

OE1	OE2	B1 – B5	B6 – B10
L	L	A1 – A5	A6 – A10
L	H	A1 – A5	Z
H	L	Z	A6 – A10
H	H	Z	Z

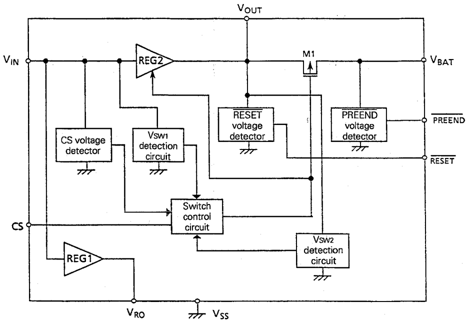
H : High Level
L : Low Level
X : Don't Care
Z : High Impedance


A1
A5
B1
B5
OE1
A6
A10
B6
B10
OE2

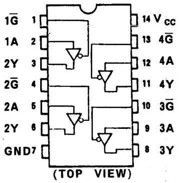
■ S-8423LFS-X [SEIKO] (Battery Back-up Selector)


8 pin SSOP
Top view
V_{SS} 1
PREEND 2
V_{BAT} 3
CS 4
8 V_{RO}
7 V_{IN}
6 V_{OUT}
5 RESET

Pin name	Description
CS	Output terminal for CS voltage detector
RESET	Output terminal for RESET voltage detector
PREEND	Output terminal for PREEND voltage detector
V_{IN}*	Input terminal for main power supply
V_{BAT}*	Power input terminal for backup
V_{OUT}*	Output terminal for voltage regulator 2
V_{RO}*	Output terminal for voltage regulator 1
Vss	GND


V_{OUT}
V_{IN}
V_{BAT}
REG2
M1
CS voltage detector
VSW1 detection circuit
RESET voltage detector
PREEND voltage detector
PREEND
RESET
CS
Switch control circuit
REG1
VSW2 detection circuit
V_{RO}
V_{SS}

■ SN74LV125APW-X [TEXAS] (Quad Bus Buffer Gates With 3-State Outputs)

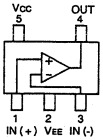

1G 1
1A 2
2Y 3
2G 4
2A 5
2Y 6
GND 7
14 Vcc
13 4G
12 4A
11 4Y
10 3G
9 3A
8 3Y
(TOP VIEW)

TC74HC125A TRUE Table

INPUTS		OUTPUTS
G	A	Y
H	X	Z
L	L	L
L	H	H

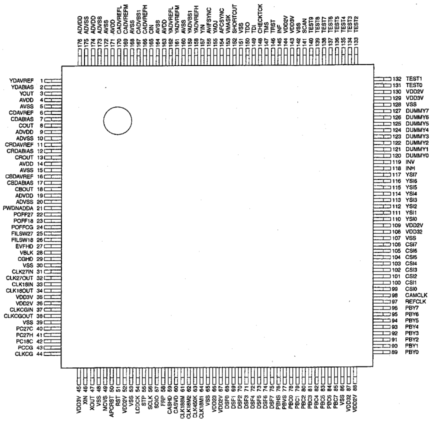
X : Don't Care
Z : High Impedance

■ TA75S01F-X [TOSHIBA] (Single Op.Amp.)


Vcc 5
OUT 4
+
-
1 IN (+)
2 VEE
3 IN (-)

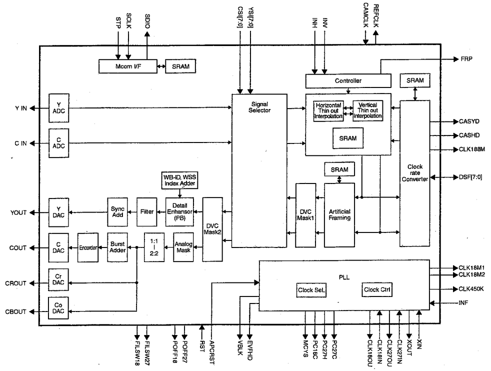
■ T9P90EF [TOSHIBA]
(A/D and D/A Converter for Video Signal)

(Top View)



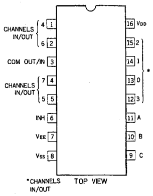
176 ADVDD
175 ADVSS
174 ADVDD
173 ADVSS
172 AVSS
171 AVDD
170 CADVREFL
169 CADVREFM
168 AVSS
167 CADVBS1
166 CADVREFH
165 CIN
164 AVSS
163 AVDD
162 YADVREFL
161 YADVREFM
160 AVSS
159 YADVBS1
158 YADVREFH
157 YIN
156 AVIFSYNC
155 YADJ
154 AFCSYNC
153 VMASK
152 SHORTCUT
151 VSS
150 TDO
149 TDI
148 CHECKTCK
147 TMS
146 TRST
145 INF
144 VDD2V
143 VDD3V
142 VSS
141 SCAN
140 TEST9
139 TEST8
138 TEST7
137 TEST6
136 TEST5
135 TEST4
134 TEST3
133 TEST2
YDAVREF 1
YDABIAS 2
YOUT 3
AVDD 4
AVSS 5
CDAVREF 6
CDABIAS 7
COUT 8
ADVDD 9
ADVSS 10
CRDAVREF 11
CRDABIAS 12
CROUT 13
AVDD 14
AVSS 15
CBDAVREF 16
CBDABIAS 17
CBOUT 18
ADVDD 19
ADVSS 20
PWDNADDA 21
POFF27 22
POFF18 23
POFFCG 24
FILSW27 25
FILSW18 26
EVFHD 27
VBLK 28
CGHD 29
VSS 30
CLK27IN 31
CLK27OUT 32
CLK18IN 33
CLK18OUT 34
VDD3V 35
VDD2V 36
CLKCGIN 37
CLKCGOUT 38
VSS 39
PC27C 40
PC27H 41
PC18C 42
PCCG 43
CLKCG 44
132 TEST1
131 TEST0
130 VDD2V
129 VDD3V
128 VSS
127 DUMMY7
126 DUMMY6
125 DUMMY5
124 DUMMY4
123 DUMMY3
122 DUMMY2
121 DUMMY1
120 DUMMY0
119 INV
118 INH
117 YSI7
116 YSI6
115 YSI5
114 YSI4
113 YSI3
112 YSI2
111 YSI1
110 YSI0
109 VDD2V
108 VDD32
107 VSS
106 CSI7
105 CSI6
104 CSI5
103 CSI4
102 CSI3
101 CSI2
100 CSI1
99 CSI0
98 CAMCLK
97 REFCLK
96 PBY7
95 PBY6
94 PBY5
93 PBY4
92 PBY3
91 PBY2
90 PBY1
89 PBY0
VDD3V 45
XIN 46
XOUT 47
VSS 48
MCVS 49
APCRST 50
RST 51
VDD2V 52
VSS 53
LCDCK 54
STP 55
SCLK 56
SDIO 57
FRP 58
CASHD 59
CASVD 60
CLK188M 61
CLK18M2 62
CLK450K 63
CLK18M1 64
VSS 65
VDD23 66
VDD2V 67
DSF0 68
DSF1 69
DSF2 70
DSF3 71
DSF4 72
DSF5 73
DSF6 74
DSF7 75
PBHS 76
PBVS 77
PBC0 78
PBC1 79
PBC2 80
PBC3 81
PBC4 82
PBC5 83
PBC6 84
PBC7 85
VSS 86
VDD32 87
VDD2V 88

BLOCK DIAGRAM



STP
SCLK
SDIO
CSI[7:0]
YSI[7:0]
INH
INV
CAMCLK
REFCLK
Mcom I/F
SRAM
Controller
SRAM
FRP
Y IN
Y ADC
C IN
C ADC
Signal Selector
Horizontal Thin out Interpolation
Vertical Thin out Interpolation
SRAM
CASYD
CASHD
CLK188M
SRAM
Clock rate Converter
DSF[7:0]
WB-ID, WSS Index Adder
YOUT
Y DAC
Sync Add
Filter
Detail Enhansor (PB)
DVC Mask2
DVC Mask1
Artificial Framing
COUT
C DAC
Encorder
Burst Adder
1:1 | 2:2
Analog Mask
CROUT
Cr DAC
CBOUT
Co DAC
PLL
Clock SeL
Clock Ctrl
CLK18M1
CLK18M2
CLK450K
INF
FILSW18
FILSW27
POFF18
POFF27
RST
APCRST
VBLK
EVFHD
MCYS
PC18C
PC27H
PC27C
CLK18OU
CLK18IN
CLK27OU
CLK27IN
XOUT
XIN

■ TC4051BF-X [TOSHIBA]
(Single 8 Channel Analog Multiplexers/Demultiplexers)

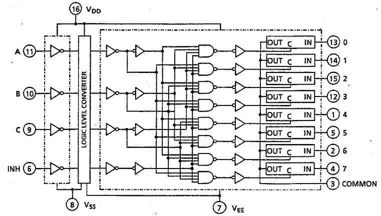


CHANNELS IN/OUT
4
6
COM OUT/IN 3
CHANNELS IN/OUT
7
5
INH 6
VEE 7
Vss 8
16 VDD
15 2
14 1
13 0
12 3
*
11 A
10 B
9 C
*CHANNELS IN/OUT
TOP VIEW

TRUTH TABLE

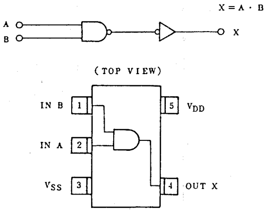
CONTROL INPUTS				"ON" CHANNEL
INHIBIT	C△	B	A	4051
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7
H	※	※	※	NONE
※ Don't Care.				

LOGIC DIAGRAM



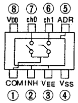
⑯ VDD
A ⑪
B ⑩
C ⑨
INH ⑥
LOGIC LEVEL CONVERTER
OUT C IN
⑬ 0
⑭ 1
⑮ 2
⑫ 3
① 4
⑤ 5
② 6
④ 7
③ COMMON
⑧ VSS
⑦ VEE

■ TC4S81F-X [TOSHIBA]
(2-Input AND Gate)



X = A · B
A
B
X
(TOP VIEW)
IN B 1
IN A 2
VSS 3
5 VDD
4 OUT X

■ TC4W53F-X [TOSHIBA]
(2-Channel Multiplexer)



⑧ ⑦ ⑥ ⑤
VDD ch0 ch1 ADR
COM INH VEE VSS
① ② ③ ④

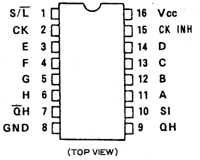
TRUE TABLE

CONTROL INPUT		ON CHANNEL
INH	ADR	
L	L	ch0
L	H	ch1
H	*	NONE

*Don't care

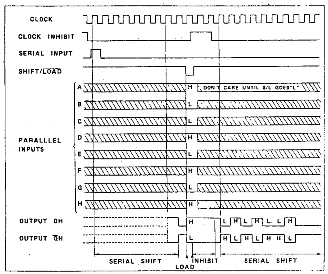
■ TC4W53FU-X [TOSHIBA]
(Refer to TC4W53F-X)

■ TC74HC165AF-X [TOSHIBA]
(8-Bit Serial or Parallel-In/Serial Out Shift Registers With Complementary Out)

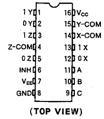


S/L̄ 1
CK 2
E 3
F 4
G 5
H 6
Q̄H 7
GND 8
16 Vcc
15 CK INH
14 D
13 C
12 B
11 A
10 SI
9 QH
(TOP VIEW)

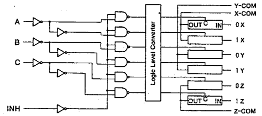
Timing chart



■ TC74HC4053AFT-X [TOSHIBA]
(Triple 2-Channel Analog Multiplexer/Demultiplexer)



1Y 1
0Y 2
1Z 3
Z-COM 4
0Z 5
INH 6
VEE 7
GND 8
16 Vcc
15 Y-COM
14 X-COM
13 1X
12 0X
11 A
10 B
9 C
(TOP VIEW)



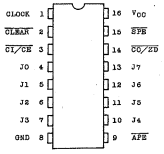
A
B
C
INH
Logic Level Converter
OUT C IN
Y-COM
X-COM
0X
1X
0Y
1Y
0Z
1Z
Z-COM

TRUE Table

CONTROL INPUTS				"ON" CHANNEL
INHIBIT	C∗	B	A	HC4053A
L	L	L	L	0X, 0Y, 0Z
L	L	L	H	1X, 0Y, 0Z
L	L	H	L	0X, 1Y, 0Z
L	L	H	H	1X, 1Y, 0Z
L	H	L	L	0X, 0Y, 1Z
L	H	L	H	1X, 0Y, 1Z
L	H	H	L	0X, 1Y, 1Z
L	H	H	H	1X, 1Y, 1Z
H	X	X	X	NONE

X : DON'T CARE

■ TC74HC40103AF-X [TOSHIBA]
(8-Bit Binary Programmable Down Counter)


CLOCK 1
CLEAR 2
CI/CE 3
J0 4
J1 5
J2 6
J3 7
GND 8
16 Vcc
15 SPE
14 CO/ZD
13 J7
12 J6
11 J5
10 J4
9 APE

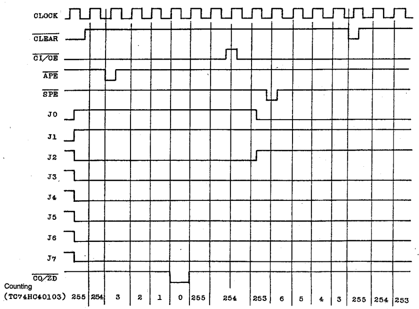
(TOP VIEW)

TRUE Table

CONTROL INPUTS				MODE	OPERATION
CLEAR	APE	BPE	CI/CE		
H	H	H	H	Counting inhibited	No counting notwithstanding clock is applied.
H	H	H	L	Normal counting	Counting-down starts at the rise of clock.
H	H	L	X	Synchronous preset	Data of PI terminal is preset at the rise of clock.
H	L	X	X	Asynchronous preset	Data of PI terminal is preset asynchronously with clock.
L	X	X	X	Cleared	Reset to the maximum count*.

Note: 1. X : Don't care.
2. Maximum count : "255" in TC74HC40103.

Timing chart

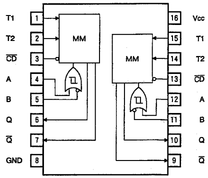

CLOCK
CLEAR
CI/CE
APE
SPE
J0
J1
J2
J3
J4
J5
J6
J7
CO/ZD
Counting
(TC74HC40103)
255
254
3
2
1
0
255
254
253
6
5
4
3
255
254
253

■ TC74VHC08FT-X [TOSHIBA]
(Refer to SN74LV08APW-X.)

■ TC74VHC125FT-X [TOSHIBA]
(Refer to SN74LV125APW-X.)

■ TC74VHC165FT-X [TOSHIBA]
(Refer to TC74HC165AF-X.)

■ TC74HC4538AF-X [TOSHIBA]
(Dual Retriggerable Monostable Multivibrator)

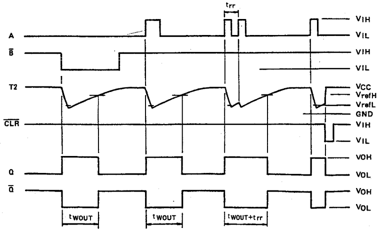

T1 1
T2 2
CD 3
A 4
B 5
Q 6
Q̄ 7
GND 8
16 Vcc
15 T1
14 T2
13 CD
12 A
11 B
10 Q
9 Q̄
MM
MM

TOP VIEW

TRUE Table

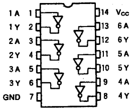
INPUT			OUTPUT		NOTE
A	B̄	CD̄	Q	Q̄	
↑	H	H	⊓	⊔	OUTPUT ENABLE
X	L	H	L	H	INHIBIT
H	X	H	L	H	INHIBIT
L	↓	H	⊓	⊔	OUTPUT ENABLE
X	X	L	L	H	INHIBIT

X:Don't Care

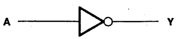

A
B̄
T2
CLR
Q
Q̄
trr
VIH
VIL
VIH
VIL
VCC
VrefH
VrefL
GND
VIH
VIL
VOH
VOL
VOH
VOL
tWOUT
tWOUT
tWOUT+trr

■ TC74HC4538AFS-X [TOSHIBA]
(Refer to TC74HC4538AF-X.)

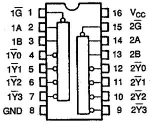
■ TC74VHC04FT-X [TOSHIBA]
(Hex Inverters)


1A 1
1Y 2
2A 3
2Y 4
3A 5
3Y 6
GND 7
14 Vcc
13 6A
12 6Y
11 5A
10 5Y
9 4A
8 4Y

(TOP VIEW)



■ TC74VHC139FT-X [TOSHIBA]
(Dual 2-Line to 4-Lile Decoders/Demultiplexers)


1G 1
1A 2
1B 3
1Y0 4
1Y1 5
1Y2 6
1Y3 7
GND 8
16 Vcc
15 2G
14 2A
13 2B
12 2Y0
11 2Y1
10 2Y2
9 2Y3

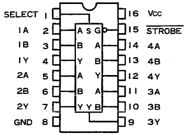
(TOP VIEW)

TRUE Table

INPUTS			OUTPUTS				SELECTED OUTPUT
ENABLE	SELECT		Ȳ0	Ȳ1	Ȳ2	Ȳ3	
Ḡ	B	A					
H	X	X	H	H	H	H	NONE
L	L	L	L	H	H	H	Ȳ0
L	L	H	H	L	H	H	Ȳ1
L	H	L	H	H	L	H	Ȳ2
L	H	H	H	H	H	L	Ȳ3

X : Don't care

■ TC74VHC157FT-X [TOSHIBA]
(Quad 2-Line to 1-Line Data Selectors/Multiplexers,NON-Inverted Data Outputs)


SELECT 1
1A 2
1B 3
1Y 4
2A 5
2B 6
2Y 7
GND 8
16 Vcc
15 STROBE
14 4A
13 4B
12 4Y
11 3A
10 3B
9 3Y
A S G
B A
Y B
A Y
B A
Y Y B

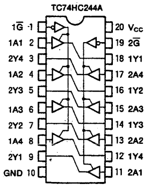
(TOP VIEW)

TRUE Table

INPUTS				OUTPUT
STROBE	SELECT	A	B	Y
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

X:DON'T CARE

■ TC74VHC244FT-X [TOSHIBA]
(Octal Buffers AND Line Drivers With NON-Inverted 3-State Outputs)


TC74HC244A
1G 1
1A1 2
2Y4 3
1A2 4
2Y3 5
1A3 6
2Y2 7
1A4 8
2Y1 9
GND 10
20 Vcc
19 2G
18 1Y1
17 2A4
16 1Y2
15 2A3
14 1Y3
13 2A2
12 1Y4
11 2A1

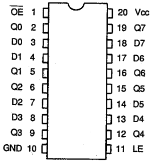
(TOP VIEW)

TRUE Table

INPUTS		OUTPUTS
Ḡ	A_n	Y_n
L	L	L
L	H	H
H	X	Z

X : Don't Care
Z : High Impedance

■ TC74VHC373FT-X [TOSHIBA]
(Octal D-Type Latch With NON-Inverted 3-State Output)

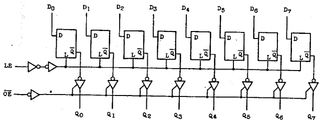

OE 1
Q0 2
D0 3
D1 4
Q1 5
Q2 6
D2 7
D3 8
Q3 9
GND 10
20 Vcc
19 Q7
18 D7
17 D6
16 Q6
15 Q5
14 D5
13 D4
12 Q4
11 LE

(Top View)

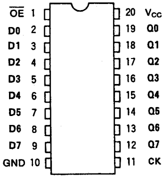
TRUE Table

INPUTS			OUTPUTS
OE	LE	D	
H	X	X	Z
L	L	X	Q_n
L	H	L	L
L	H	H	H

X : Don't Care
Z : Hi impedance
Qn : Q output level before the LE become "L".


D0
D1
D2
D3
D4
D5
D6
D7
D
L Q̄
LE
OE
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7

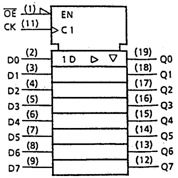
■ TC74VHC574FT-X [TOSHIBA]
(Octal D-Type EDGE-Trigger Flip-Flop With NON Inverted 3-State Outputs)



OE 1
D0 2
D1 3
D2 4
D3 5
D4 6
D5 7
D6 8
D7 9
GND 10
20 Vcc
19 Q0
18 Q1
17 Q2
16 Q3
15 Q4
14 Q5
13 Q6
12 Q7
11 CK

(TOP VIEW)

Logic

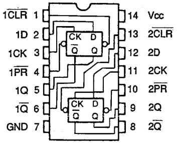


OE (1)
CK (11)
EN
C1
1D
D0 (2)
D1 (3)
D2 (4)
D3 (5)
D4 (6)
D5 (7)
D6 (8)
D7 (9)
(19) Q0
(18) Q1
(17) Q2
(16) Q3
(15) Q4
(14) Q5
(13) Q6
(12) Q7

INPUTS			OUTPUT
OE	CK	D	
H	X	X	Z
L	↓	X	Qn
L	↑	L	L
L	↑	H	H

X : Don't Care
Z : High Impedance
Qn : No Change

■ TC74VHC74FT-X [TOSHIBA]
(Dual D-Type Positive-EDGE-Triggered Flip-Flops With Preset AND Clear)



1CLR 1
1D 2
1CK 3
1PR 4
1Q 5
1Q 6
GND 7
14 Vcc
13 2CLR
12 2D
11 2CK
10 2PR
9 2Q
8 2Q
CK D
Q Q

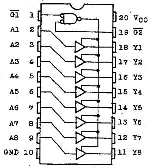
(Top View)

TRUE Table

INPUTS				OUTPUTS		FUNCTION
CLR	PR	D	CK	Q	Q	
L	H	X	X	L	H	CLEAR
H	L	X	X	H	L	PRESET
L	L	X	X	H	H	—
H	H	L	↑	L	H	—
H	H	H	↑	H	L	—
H	H	X	↓	Qn	Qn	NO CHANGE

X : Don't care

■ TC74VHCT541AFTX [TOSHIBA]
(Octal Bus Buffer With Inverted 3-State Outputs)



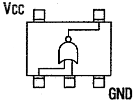
G1 1
A1 2
A2 3
A3 4
A4 5
A5 6
A6 7
A7 8
A8 9
GND 10
20 VCC
19 G2
18 Y1
17 Y2
16 Y3
15 Y4
14 Y5
13 Y6
12 Y7
11 Y8

(TOP VIEW)

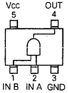
TRUE Table

INPUT			OUTPUT
G1	G2	A	Y
L	L	H	H
L	L	L	L
H	X	X	Z
X	H	X	Z

■ TC7S02FU-X [TOSHIBA]
(2 Input Single NOR Gate)



■ TC7S08FU-X [TOSHIBA]
(2 Input Single AND Gate)

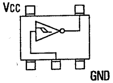


Vcc 5
OUT 4
1 IN B
2 IN A
3 GND

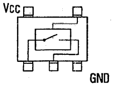
TRUE Table

A	B	X
L	L	L
L	H	L
H	L	L
H	H	H

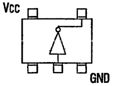
■ TC7S14FU-X [TOSHIBA]
(Schmitt trigger)



■ TC7S66FU-X [TOSHIBA]
(Analog SW)

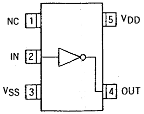


■ TC7SET04FU-X [TOSHIBA]
(Single Inverter Gate)



■ TC7SH04FU-X [TOSHIBA]
(Inverter)

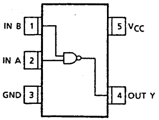
Pin arrangement



NC 1
IN 2
VSS 3
5 VDD
4 OUT

■ TC7SH00F-X [TOSHIBA]
(2 Input NAND Gate)

(Top View)



IN B 1
IN A 2
GND 3
5 VCC
4 OUT Y

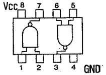
TRUE Table

A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

■ TC7SH08F-X [TOSHIBA]
(Refer to TC7S08FU-X.)

■ TC7SH08FU-X [TOSHIBA]
(Refer to TC7S08FU-X.)

■ TC7W00FU-X [TOSHIBA]
(2 Input Dual NAND Gate)

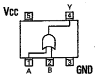


Vcc 8
7
6
5
1
2
3
4 GND

TRUE Table

A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

■ TC7SH32FU-X [TOSHIBA]
(2 Input Single OR Gate)

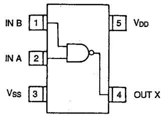


Vcc 5
Y 4
1 A
2 B
3 GND

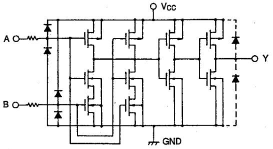
TRUE Table

A	B	Y
H	H	H
L	H	H
H	L	H
L	L	L

■ TC7SH00FU-X [TOSHIBA]
(2-Input NAND Gate)



IN B 1
IN A 2
Vss 3
5 VDD
4 OUT X



TRUE Table

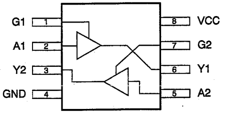
A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

■ TC7SHU04FU-X [TOSHIBA]
(Refer to TC7SH04FU-X.)

■ TC7SU04FU-X [TOSHIBA]
(Refer to TC7SH04FU-X.)

■ TC7W126FU-X [TOSHIBA]
(Dual Bus Buffer)

(TOP VIEW)



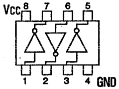
G1 1
A1 2
Y2 3
GND 4
8 VCC
7 G2
6 Y1
5 A2

Truth Table

INPUTS		OUTPUTS
G	A	Y
L	X	Z
H	L	L
H	H	H

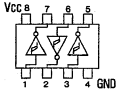
X : Don't Cate
Z : High Impedance

■ TC7W04FU-X [TOSHIBA]
(Triple Inverter Gate)

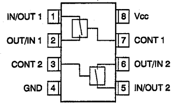


Vcc 8
7
6
5
1
2
3
4 GND

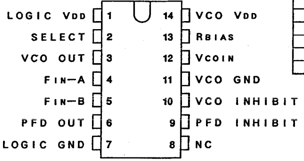
■ TC7W14FU-X [TOSHIBA]
(Schmitt Trigger Triple Inverte Gate)


Vcc 8
7
6
5
1
2
3
4 GND

■ TC7W66FU-X [TOSHIBA]
(Dual Birateral Switch)

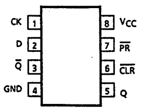

IN/OUT 1 1
OUT/IN 1 2
CONT 2 3
GND 4
8 Vcc
7 CONT 1
6 OUT/IN 2
5 IN/OUT 2

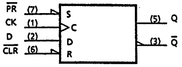
■ TLC2932IPW-X [TEXAS]
(PLL)


LOGIC VDD 1
SELECT 2
VCO OUT 3
FIN–A 4
FIN–B 5
PFD OUT 6
LOGIC GND 7
14 VCO VDD
13 RBIAS
12 VCOIN
11 VCO GND
10 VCO INHIBIT
9 PFD INHIBIT
8 NC

■ TC7W74FU-X [TOSHIBA]
(D-Q Flip-Flop)

(TOP VIEW)


CK 1
D 2
Q̄ 3
GND 4
8 Vcc
7 PR
6 CLR
5 Q


PR (7)
CK (1)
D (2)
CLR (6)
S
C
D
R
(5) Q
(3) Q̄

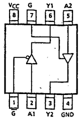
TRUE Table

INPUTS				OUTPUTS		FUNCTION
$\overline{CLR}$	$\overline{PR}$	D	CK	Q	$\overline{Q}$	
L	H	×	×	L	H	CLEAR
H	L	×	×	H	L	PRESET
L	L	×	×	H	H	—
H	H	L	↑	L	H	—
H	H	H	↑	H	L	—
H	H	×	↓	Q_n	$\overline{Q}_n$	NO CHANGE

× : Don't care

■ TC7WT241FU-X [TOSHIBA]
(Dual Bus Buffer Non Inverted 3-State Outputs)

(TOP VIEW)

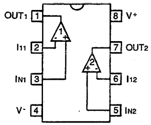

Vcc 8
G 7
Y1 6
A2 5
G 1
A1 2
Y2 3
GND 4

TRUTH TABLE

INPUTS			OUTPUTS
$\overline{G}$	G	A	Y
L	H	L	L
L	H	H	H
H	L	×	Z

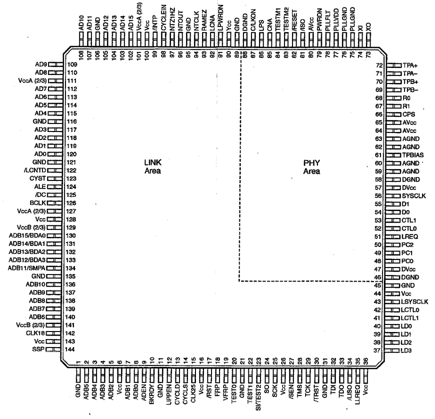
× : Don't Care
Z : High Impedance

■ UPC812G2-X [NEC]
(Op.Amp.)

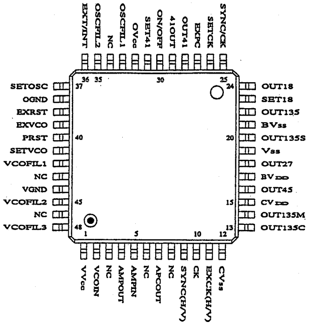

OUT1 1
I11 2
IN1 3
V- 4
8 V+
7 OUT2
6 I12
5 IN2
1
2

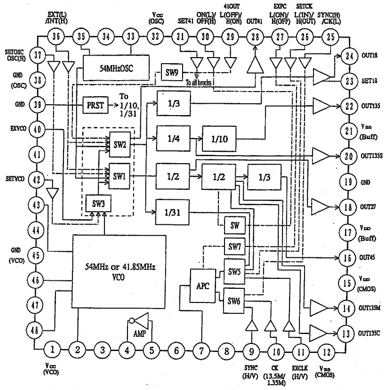
■ TSB13LV11PBW [TEXAS]
(IEEE1394 LINK/PHY)

(TOP VIEW)

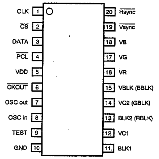

LINK Area
PHY Area
AD9 109
AD8 110
VccA (2/3) 111
AD7 112
AD6 113
AD5 114
AD4 115
GND 116
AD3 117
AD2 118
AD1 119
AD0 120
GND 121
/LCNTD 122
CYST 123
ALE 124
/DC 125
BCLK 126
VccA (2/3) 127
Vcc 128
VccB (2/3) 129
ADB15/BDA0 130
ADB14/BDA1 131
ADB13/BDA2 132
ADB12/BDA3 133
ADB11/SMPA 134
GND 135
ADB10 136
ADB9 137
ADB8 138
ADB7 139
ADB6 140
VccB (2/3) 141
CLK18 142
Vcc 143
SSP 144
72 TPA+
71 TPA–
70 TPB+
69 TPB–
68 R0
67 R1
66 CPS
65 AVcc
64 AVcc
63 AGND
62 AGND
61 TPBIAS
60 AGND
59 AGND
58 DGND
57 DVcc
56 SYSCLK
55 D1
54 D0
53 CTL1
52 CTL0
51 LREQ
50 PC2
49 PC1
48 PC0
47 DVcc
46 DGND
45 GND
44 Vcc
43 LSYSCLK
42 LCTL0
41 LCTL1
40 LD0
39 LD1
38 LD2
37 LD3

■ UPC2384GA [NEC]
(Digital VTR PLL)

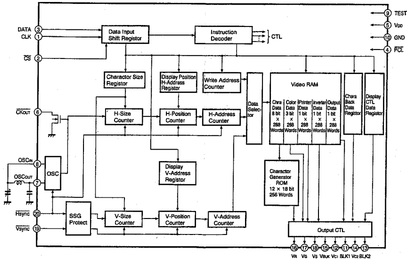

EXT/INT
OSCFIL2
NC
OSCFIL1
OVcc
SET41
ON/OFF
410UT
OUT41
EXPC
SETCK
SYNC/CK
SETOSC 37
OGND
EXRST
EXVCO
PRST 40
SETVCO
VCOFIL1
NC
VGND
VCOFIL2 45
NC
VCOFIL3 48
36 35 30 25 24
OUT18
SET18
OUT135
BVss
OUT135S 20
Vss
OUT27
BVDD
OUT45
CVDD 15
OUT135M
OUT135C 13
1 5 10 12
VVcc
VCOIN
NC
AMPOUT
AMPIN
NC
APCOUT
NC
SYNC(H/V)
CK
EXCK(H/V)
CVss


EXT(L) /INT(H)
Vcc (OSC)
SET41
ON(L)/ OFF(H)
410UT L(OFF)/ H(ON)
OUT41
EXPC L(ON)/ H(OFF)
SETCK L(IN)/ H(OUT)
SYNC(H) /CK(L)
SETOSC OSC(H)
GND (OSC)
GND
EXVCO
SETVCO
GND (VCO)
54MHzOSC
SW9
To all brocks
PRST
To 1/10, 1/31
1/3
1/4
1/10
SW2
SW1
1/2
1/2
1/3
SW3
1/31
SW
SW7
SW5
SW6
APC
54MHz or 41.85MHz VCO
AMP
OUT18
SET18
OUT135
Vss (Buff)
OUT135S
GND
OUT27
VDD (Buff)
OUT45
VDD (CMOS)
OUT135M
OUT135C
Vcc (VCO)
SYNC (H/V)
CK (13.5M/ 1.35M)
EXCLK (H/V)
Vss (CMOS)

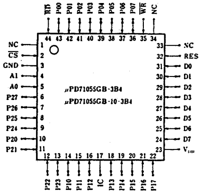
■ UPD6461GS-913 [NEC]
(On Screen Charactor Display)

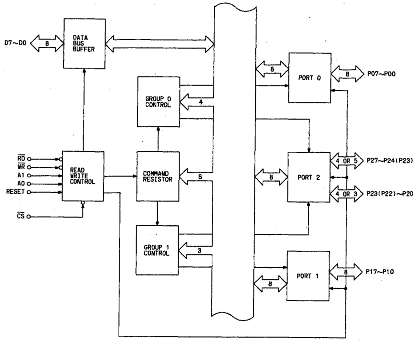

CLK 1
CS 2
DATA 3
PCL 4
VDD 5
CKOUT 6
OSC out 7
OSC in 8
TEST 9
GND 10
20 Hsync
19 Vsync
18 VB
17 VG
16 VR
15 VBLK (BBLK)
14 VC2 (GBLK)
13 BLK2 (RBLK)
12 VC1
11 BLK1

(Top View)


DATA
CLK
CS
CKout
OSCIN
OSCOUT
Hsync
Vsync
TEST
VDD
GND
PCL
Data Input Shift Register
Instruction Decoder
CTL
Charactor Size Register
Display Position H-Address Register
Write Address Counter
Video RAM
Data Selector
H-Size Counter
H-Position Counter
H-Address Counter
Chara Data 8 bit × 288 Words
Color Data 3 bit × 288 Words
Printer Data 1 bit × 288 Words
Inverter Data 1 bit × 288 Words
Output Data 1 bit × 288 Words
Chara Back Data Register
Display CTL Data Register
OSC
Display V-Address Register
Charactor Generator ROM 12 × 18 bit 256 Words
SSG Protect
V-Size Counter
V-Position Counter
V-Address Counter
Output CTL
VR VG VB VBLK VC1 BLK1 VC2 BLK2

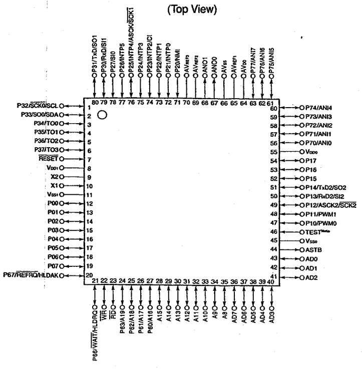
■ UPD71055GB-10 [NEC]
(Parallel Input/Output Port)


μPD71055GB-3B4
μPD71055GB-10-3B4
NC
CS
GND
A1
A0
P27
P26
P25
P24
P20
P21
RESET
D0
D1
D2
D3
D4
D5
D6
D7
V_DD

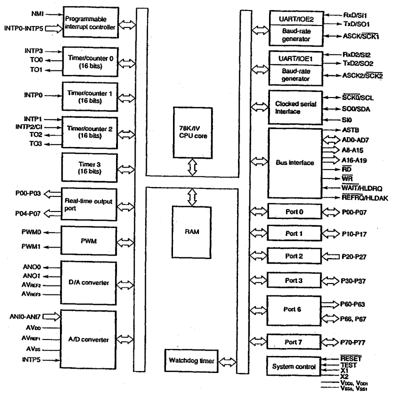

D7~D0
DATA BUS BUFFER
GROUP 0 CONTROL
GROUP 1 CONTROL
READ WRITE CONTROL
COMMAND RESISTOR
PORT 0
PORT 2
PORT 1
P07~P00
P27~P24(P23)
P23(P22)~P20
P17~P10
RD
WR
A1
A0
RESET
CS
8
4
3
4 OR 5
4 OR 3

■ UPD784031GK-BE9 [NEC]
(16bit Single Chip Micro Computer)

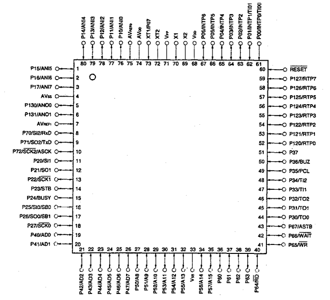
(Top View)

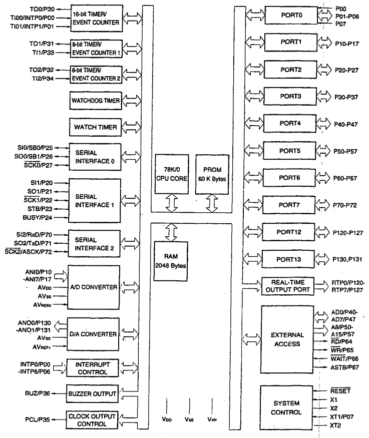


Note Connect the TEST pin to V_{SS0} directly.


Programmable interrupt controller
Timer/counter 0 (16 bits)
Timer/counter 1 (16 bits)
Timer/counter 2 (16 bits)
Timer 3 (16 bits)
Real-time output port
PWM
D/A converter
A/D converter
78K/IV CPU core
RAM
Watchdog timer
UART/IOE2
Baud-rate generator
UART/IOE1
Clocked serial interface
Bus interface
Port 0
Port 1
Port 2
Port 3
Port 6
Port 7
System control

■ UPD78P058BT [NEC]
(8 Bit Single Chip Microcomputer)



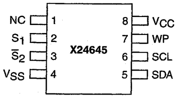

16-bit TIMER/ EVENT COUNTER
8-bit TIMER/ EVENT COUNTER 1
8-bit TIMER/ EVENT COUNTER 2
WATCHDOG TIMER
WATCH TIMER
SERIAL INTERFACE 0
SERIAL INTERFACE 1
SERIAL INTERFACE 2
A/D CONVERTER
D/A CONVERTER
INTERRUPT CONTROL
BUZZER OUTPUT
CLOCK OUTPUT CONTROL
78K/0 CPU CORE
PROM 60 K Bytes
RAM 2048 Bytes
PORT0
PORT1
PORT2
PORT3
PORT4
PORT5
PORT6
PORT7
PORT12
PORT13
REAL-TIME OUTPUT PORT
EXTERNAL ACCESS
SYSTEM CONTROL

P00-P07 : Port0
P10-P17 : Port1
P20-P27 : Port2
P30-P37 : Port3
P40-P47 : Port4
P50-P57 : Port5
P60-P67 : Port6
P70-P72 : Port7
P120-P127 : Port12
P130, P131 : Port13
RTP0-RTP7 : Real-Time Output Port
INTP0-INTP6 : Interrupt from Peripherals
TI00, TI01 : Timer Input
TI1, TI2 : Timer Input
TO0-TO2 : Timer Output

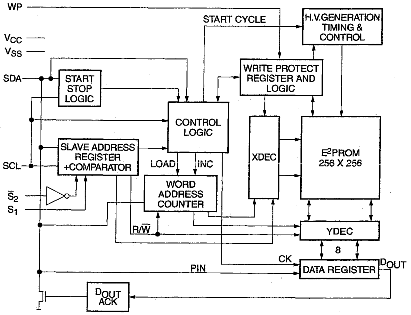
SB0, SB1 : Serial Bus
SI0-SI2 : Serial Input
SO0-SO2 : Serial Output
$\overline{SCK0}$-$\overline{SCK2}$: Serial Clock
RxD : Receive Data
TxD : Transmit Data
ASCK : Asynchronous Serial Clock
PCL : Programmable Clock
BUZ : Buzzer Clock
STB : Strobe
BUSY : Busy
AD0 AD7 : Address/Data Bus
A8-A15 : Address Bus
$\overline{RD}$: Read Strobe
$\overline{WR}$: Write Strobe

$\overline{WAIT}$: Wait
ASTB : Address Strobe
X1, X2 : Crystal (Main System Clock)
XT1, XT2 : Crystal (Subsystem Clock)
$\overline{RESET}$: Reset
ANI0-ANI7 : Analog Input
ANO0, ANO1 : Analog Output
AV_{DD} : Analog Power Supply
AV_{SS} : Analog Ground
$AV_{REF0,1}$: Analog Reference Voltage
V_{DD} : Power Supply
V_{PP} : Programming Power Supply
V_{SS} : Ground

■ X24645S8-2.7-X [XICOR]
(8K x 8bit CMOS Serial EEPROM)


X24645
NC 1
S1 2
S2 3
VSS 4
8 VCC
7 WP
6 SCL
5 SDA

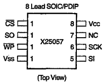
(Top View)

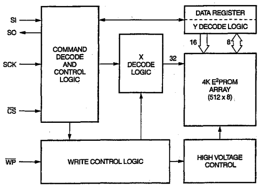

WP
VCC
VSS
SDA
SCL
S2
S1
START CYCLE
H.V.GENERATION TIMING & CONTROL
START STOP LOGIC
WRITE PROTECT REGISTER AND LOGIC
CONTROL LOGIC
SLAVE ADDRESS REGISTER +COMPARATOR
LOAD
INC
WORD ADDRESS COUNTER
XDEC
E2PROM 256 X 256
R/W
YDEC
8
CK
PIN
DATA REGISTER
DOUT
DOUT ACK

PIN NAMES

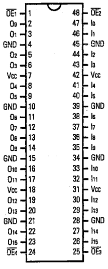
Symbol	Description
S_1, $\overline{S_2}$	Device Select Inputs
SDA	Serial Data
SCL	Serial Clock
WP	Write Protect
V_{SS}	Ground
V_{CC}	Supply Voltage
NC	No Connect

■ X25057M8-2.7-X [XICOR] (SPI Serial EEPROM)

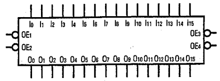

8 Lead SOIC/PDIP
CS 1
SO 1
WP 1
Vss 1
X25057
8 Vcc
7 NC
6 SCK
5 SI
(Top View)


SI
SO
SCK
CS
WP
COMMAND DECODE AND CONTROL LOGIC
X DECODE LOGIC
DATA REGISTER
Y DECODE LOGIC
16
8
32
4K E²PROM ARRAY (512 x 8)
WRITE CONTROL LOGIC
HIGH VOLTAGE CONTROL

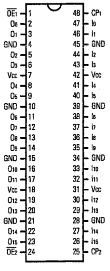
■ 74LCX16244MTD-X [NATIONAL SEMI CONDUCTOR] (16 bit Buffer/Line Driver)


OE1 1
O0 2
O1 3
GND 4
O2 5
O3 6
Vcc 7
O4 8
O5 9
GND 10
O6 11
O7 12
O8 13
O9 14
GND 15
O10 16
O11 17
Vcc 18
O12 19
O13 20
GND 21
O14 22
O15 23
OE4 24
48 OE2
47 I0
46 I1
45 GND
44 I2
43 I3
42 Vcc
41 I4
40 I5
39 GND
38 I6
37 I7
36 I8
35 I9
34 GND
33 I10
32 I11
31 Vcc
30 I12
29 I13
28 GND
27 I14
26 I15
25 OE3

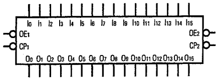
(Top View)


I0 I1 I2 I3 I4 I5 I6 I7 I8 I9 I10 I11 I12 I13 I14 I15
OE1
OE2
OE3
OE4
O0 O1 O2 O3 O4 O5 O6 O7 O8 O9 O10 O11 O12 O13 O14 O15

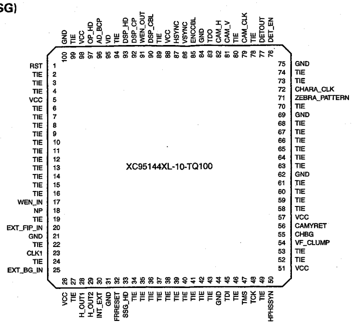
■ 74LCX16374MTD-X [NATIONAL SEMI CONDUCTOR] (16 bit D-Type Flip-Flop)


OE1 1
O0 2
O1 3
GND 4
O2 5
O3 6
Vcc 7
O4 8
O5 9
GND 10
O6 11
O7 12
O8 13
O9 14
GND 15
O10 16
O11 17
Vcc 18
O12 19
O13 20
GND 21
O14 22
O15 23
OE2 24
48 CP1
47 I0
46 I1
45 GND
44 I2
43 I3
42 Vcc
41 I4
40 I5
39 GND
38 I6
37 I7
36 I8
35 I9
34 GND
33 I10
32 I11
31 Vcc
30 I12
29 I13
28 GND
27 I14
26 I15
25 CP2

(Top View)

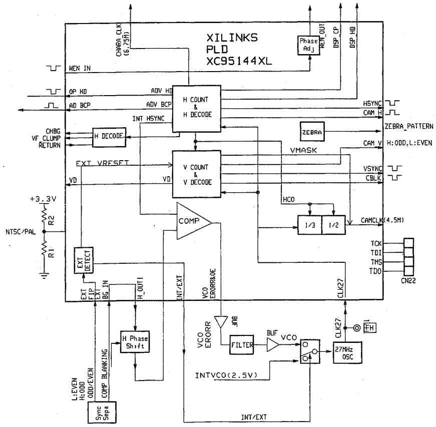

I0 I1 I2 I3 I4 I5 I6 I7 I8 I9 I10 I11 I12 I13 I14 I15
OE1
CP1
OE2
CP2
O0 O1 O2 O3 O4 O5 O6 O7 O8 O9 O10 O11 O12 O13 O14 O15

■ XC95144X10T-002 [XILINX] (SSG)

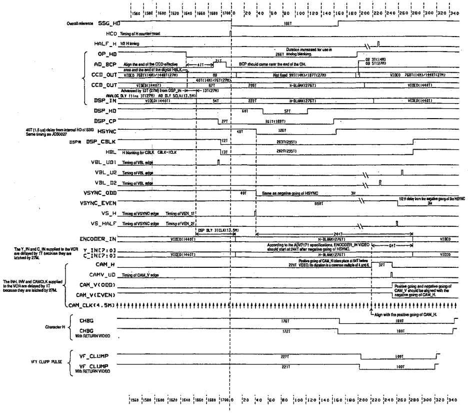

XC95144XL-10-TQ100
RST 1
TIE 2
TIE 3
TIE 4
VCC 5
TIE 6
TIE 7
TIE 8
TIE 9
TIE 10
TIE 11
TIE 12
TIE 13
TIE 14
TIE 15
TIE 16
WEN_IN 17
NP 18
TIE 19
EXT_FIP_IN 20
GND 21
TIE 22
CLK1 23
TIE 24
EXT_BG_IN 25
26 VCC
27 TIE
28 H_OUT1
29 H_OUT2
30 INT_EXT
31 GND
32 FRRESET
33 SSG_HD
34 TIE
35 TIE
36 TIE
37 TIE
38 TIE
39 TIE
40 TIE
41 TIE
42 TIE
43 TIE
44 GND
45 TDI
46 TIE
47 TMS
48 TCK
49 TIE
50 HPHSSYN
51 VCC
52 TIE
53 TIE
54 VF_CLUMP
55 CHBG
56 CAMYRET
57 VCC
58 TIE
59 TIE
60 TIE
61 TIE
62 GND
63 TIE
64 TIE
65 TIE
66 TIE
67 TIE
68 TIE
69 GND
70 TIE
71 ZEBRA_PATTERN
72 CHARA_CLK
73 TIE
74 TIE
75 GND
76 DET_EN
77 DETOUT
78 TIE
79 CAM_CLK
80 TIE
81 CAM_V
82 CAM_H
83 TDO
84 GND
85 ENCCBL
86 VSYNC
87 HSYNC
88 VCC
89 TIE
90 DSP_CBL
91 WEN_OUT
92 DSP_CP
93 DSP_HD
94 TIE
95 VD
96 AD_BCP
97 OP_HD
98 VCC
99 TIE
100 GND

Legend : TIE = Tie pin to GND or board trace driven to valid logic level
VCC = Dedicated Power Pin
GND = Dedicated Ground Pin
TDI = Test Data In, JTAG pin
TDO = Test Data Out, JTAG pin
TCK = Test Clock, JTAG pin
TMS = Test Mode Select, JTAG pin
PROHIBITED = User reserved pin

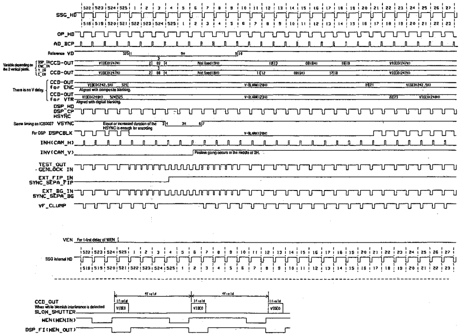
BLOCK DIAGRAM


XILINKS PLD XC95144XL
CHARA CLK (6.75M)
Phase Adj
WEN OUT
DSP CP
DSP HD
WEN IN
OP HD
AD BCP
ADV HD
ADV BCP
INT HSYNC
H COUNT & H DECODE
HSYNC
CAM H
ZEBRA
ZEBRA_PATTERN
CAM V
H:ODD, L:EVEN
CHBG
VF CLUMP
RETURN
H DECODE
VMASK
EXT VRESET
VD
V COUNT & V DECODE
VSYNC
CBLK
HCO
+3.3V
R2
R1
NTSC/PAL
COMP
1/3
1/2
CAMCLK(4.5M)
TCK
TDI
TMS
TDO
CN22
EXT DETECT
EXT FIP
EXT BG IN
H_OUT1
INT/EXT
VCO ERORR&OE
CLK27
BUF
FH
VCO ERORR
FILTER
BUF
VCO
27MHz OSC
H Phase Shift
COMP BLANKING
L:EVEN H:ODD ODD/EVEN
Sync Sepa
INTVCO(2.5V)
INT/EXT

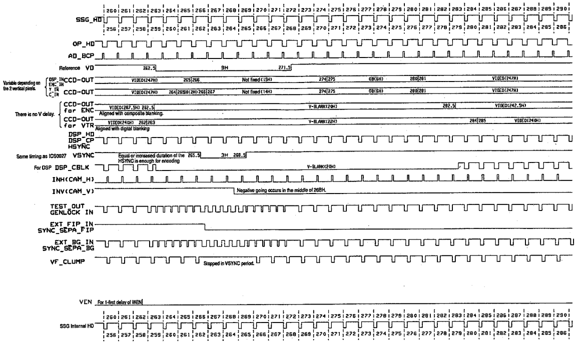
NTSC H-Timing Chart



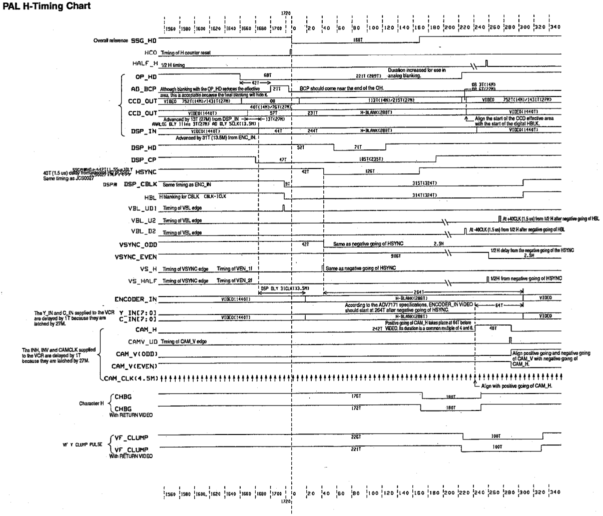
NTSC 1st Field Timing Chart



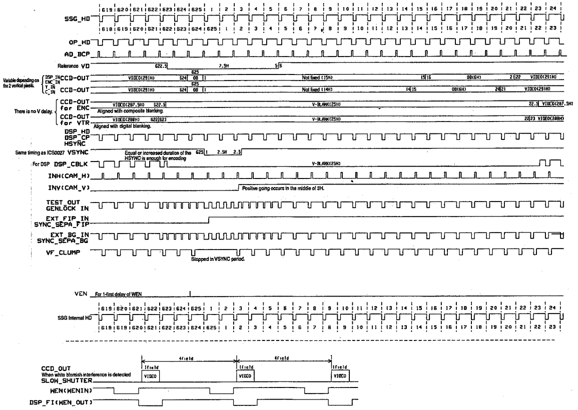
NTSC 2nd Field Timing Chart


SSG_HD
OP_HD
AD_BCP
Reference VD
Variable depending on the 2 vertical pixels.
CCD-OUT
CCD-OUT
There is no V delay.
CCD-OUT for ENC
CCD-OUT for VTR
Aligned with composite blanking.
Aligned with digital blanking.
DSP_HD DSP_CP HSYNC
Same timing as ICS0027 VSYNC
For DSP DSP_CBLK
INH(CAM_H)
INV(CAM_V)
Negative going occurs in the middle of 268H.
TEST_OUT GENLOCK IN
EXT_FIP_IN SYNC_SEPA_FIP
EXT_BG_IN SYNC_SEPA_BG
VF_CLUMP
Stopped in VSYNC period.
VEN
For 1-first delay of WEN
SSG Internal HD

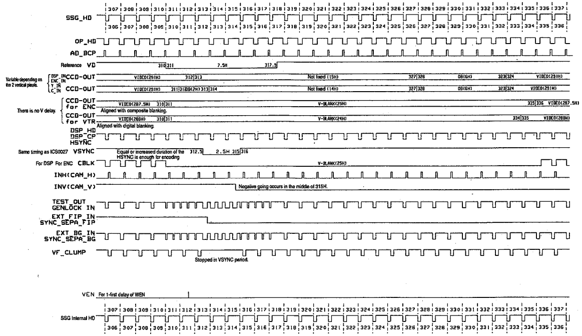
PAL H-Timing Chart


Overall reference SSG_HD
HCO
Timing of H counter reset
HALF_H
1/2 H timing
OP_HD
AD_BCP
CCD_OUT
CCD_OUT
DSP_IN
DSP_HD
DSP_CP
HSYNC
Same timing as JCS0027
DSP_CBLK
HBL
VBL_UD1
VBL_U2
VBL_D2
VSYNC_ODD
VSYNC_EVEN
VS_H
VS_HALF
ENCODER_IN
The Y_IN and C_IN supplied to the VCR are delayed by 1T because they are latched by 27M.
Y_IN[7:0]
C_IN[7:0]
CAM_H
CAMV_UD
The INH, INV and CAMCLK supplied to the VCR are delayed by 1T because they are latched by 27M.
CAM_V(ODD)
CAM_V(EVEN)
CAM_CLK(4.5M)
Align with positive going of CAM_H.
Character H
CHBG
CHBG With RETURN VIDEO
VF Y CLUMP PULSE
VF_CLUMP
VF_CLUMP With RETURN VIDEO

PAL 1st Field Timing Chart


SSG_HD
OP_HD
AD_BCP
Reference VD
Variable depending on the 2 vertical pixels.
CCD-OUT
CCD-OUT
There is no V delay.
CCD-OUT for ENC
CCD-OUT for VTR
Aligned with composite blanking.
Aligned with digital blanking.
DSP_HD DSP_CP HSYNC
Same timing as ICS0027 VSYNC
For DSP DSP_CBLK
INH(CAM_H)
INV(CAM_V)
Positive going occurs in the middle of 3H.
TEST_OUT GENLOCK IN
EXT_FIP_IN SYNC_SEPA_FIP
EXT_BG_IN SYNC_SEPA_BG
VF_CLUMP
Stopped in VSYNC period.
VEN
For 1-first delay of WEN
SSG Internal HD
CCD_OUT
When white blemish interference is detected
SLOW_SHUTTER
WEN(WENIN)
DSP_FI(WEN_OUT)

PAL 2nd Field Timing Chart


SSG_HD
OP_HD
AD_BCP
Reference VD
Variable depending on the 2 vertical pixels.
CCD-OUT
CCD-OUT
There is no V delay.
CCD-OUT for ENC
CCD-OUT for VTR
Aligned with composite blanking.
Aligned with digital blanking.
DSP_HD DSP_CP HSYNC
Same timing as ICS0027 VSYNC
For DSP For ENC CBLK
INH(CAM_H)
INV(CAM_V)
Negative going occurs in the middle of 315H.
TEST_OUT GENLOCK IN
EXT_FIP_IN SYNC_SEPA_FIP
EXT_BG_IN SYNC_SEPA_BG
VF_CLUMP
Stopped in VSYNC period.
VEN
For 1-first delay of WEN
SSG Internal HD

SECTION 5
EXPLODED VIEW AND PARTS LIST

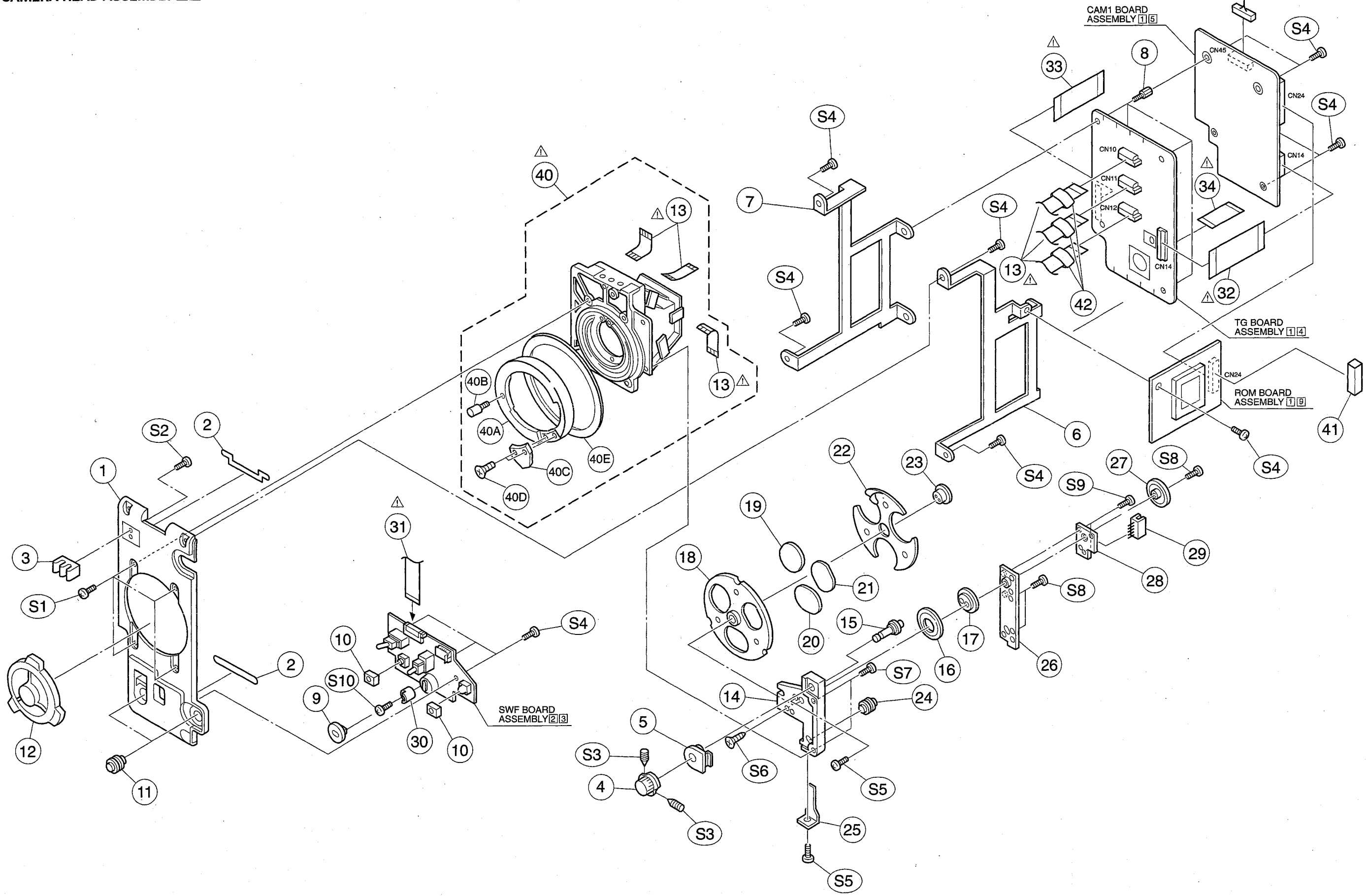
- **SAFETY PRECATION**
  Parts identified by the ⚠ symbol are critical for safety.
  Replace only with specified parts numbers.
- **NOTE**
  Parts not denoted by parts numbers are not supplied by JVC.

■ CAMERA HEAD ASSEMBLY PARTS LIST M1

M1MM☐☐☐☐

Symbol No.	Part No.	Part Name	Description
1	SC10234-001	FRONT FRAME	
2	SC44847-050	SHIELD TUBE	
3	SC42550-011	C.H.HOLDER	
4	SC32296-001	FILTER KNOB	
5	SC46517-001	GEAR HOLDER	
6	SC32291-001	TG.BRACKET(1)	
7	SC32292-001	TG.BRACKET(2)	
8	SC44974-009	STUD	
9	SC46518-001	VR KNOB	
10	SC46422-001	CUSHION	
11	SC44828-011	KNOB	
12	SC43825-002	LENS CAP	
13	SCV2803-2008B	FFC	IS TO TG
14	SC32308-001	FILTER BASE	
15	SC46524-001	F.SHAFT	
16	SC46523-001	F.I.GEAR	
17	SC44491-001	F.I.SHAFT	
18	SC31301-001	FILTER WHEEL	
19	SC43840-001	ACTIVE FILTER	CLEAR (3200K)
20	SC43841-001	ACTIVE FILTER	OREANGE (5600K)
21	SC43842-004	ACTIVE FILTER	BROWN (5600K+1/64ND)
22	SC44488-001	F.SHEET	
23	SC45539-002	F.W.SHAFT	
24	SC44482-002	F.STOPPER	
25	SC44511-002	F.SPRING	
26	SC32309-001	FILTER COVER	
27	SC44676-005	F.CAP ASSEMBLY	
28	SC84529-001	FL BOARD	
29	QGA1501C1-05	CONNECTOR	5PIN
30	SC46536-001	VR SHAFT	
⚠ 31	SCV2337-1012BD	FFC	IF TO SWF CN35
⚠ 32	SCV2803-2405B	FFC	TG TO CAM1 CN14
⚠ 33	SCV2803-5016B	FFC	PGS30553A CN21
⚠ 34	SCV2803-3012B	FFC	CAM1 TO IF CN23
⚠ 40	SCM1049-P0A	OPTICAL ASSEMBLY	(E)
⚠ 40	SCM1049-N0A	OPTICAL ASSEMBLY	(U)
40A	SC31305-003	MOUNT RING	
40B	SC40779-003	MOUNT SCREW	
40C	SC43855-001	LEVER	
40D	QYSSSP2604M	SCREW	M2.6 x 4
40E	SC46381-002	CUSHION	
41	SC45432-008	CUSHION	
42	QQR1078-001	FERRITE CORE	
S1	QYSDSP3006M	SCREW	M3 x 6
S2	QYSDSF2006M	SCREW	M2 x 6
S3	QYYASPR3004M	SCREW	M3 x 4
S4	QYSDSP2605M	SCREW	M2.6 x 5
S5	QYSPSPT2025M	SCREW	M2 x 2.5
S6	QYSSSPT2040M	SCREW	M2 x 4.0
S7	SC43397-009	SCREW	
S8	QYSPSPT2050M	SCREW	M2 x 5.0
S9	QYSPSPT2040M	SCREW	M2 x 4.0
S10	QYSPSPT1730M	SCREW	M1.7 x 3.0

5.1 CAMERA HEAD ASSEMBLY M1


CAM1 BOARD ASSEMBLY 15
CN45
CN24
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CN10
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TG BOARD ASSEMBLY 14
CN24
ROM BOARD ASSEMBLY 19
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S4
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40C
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40E
S2
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S4
SWF BOARD ASSEMBLY 23
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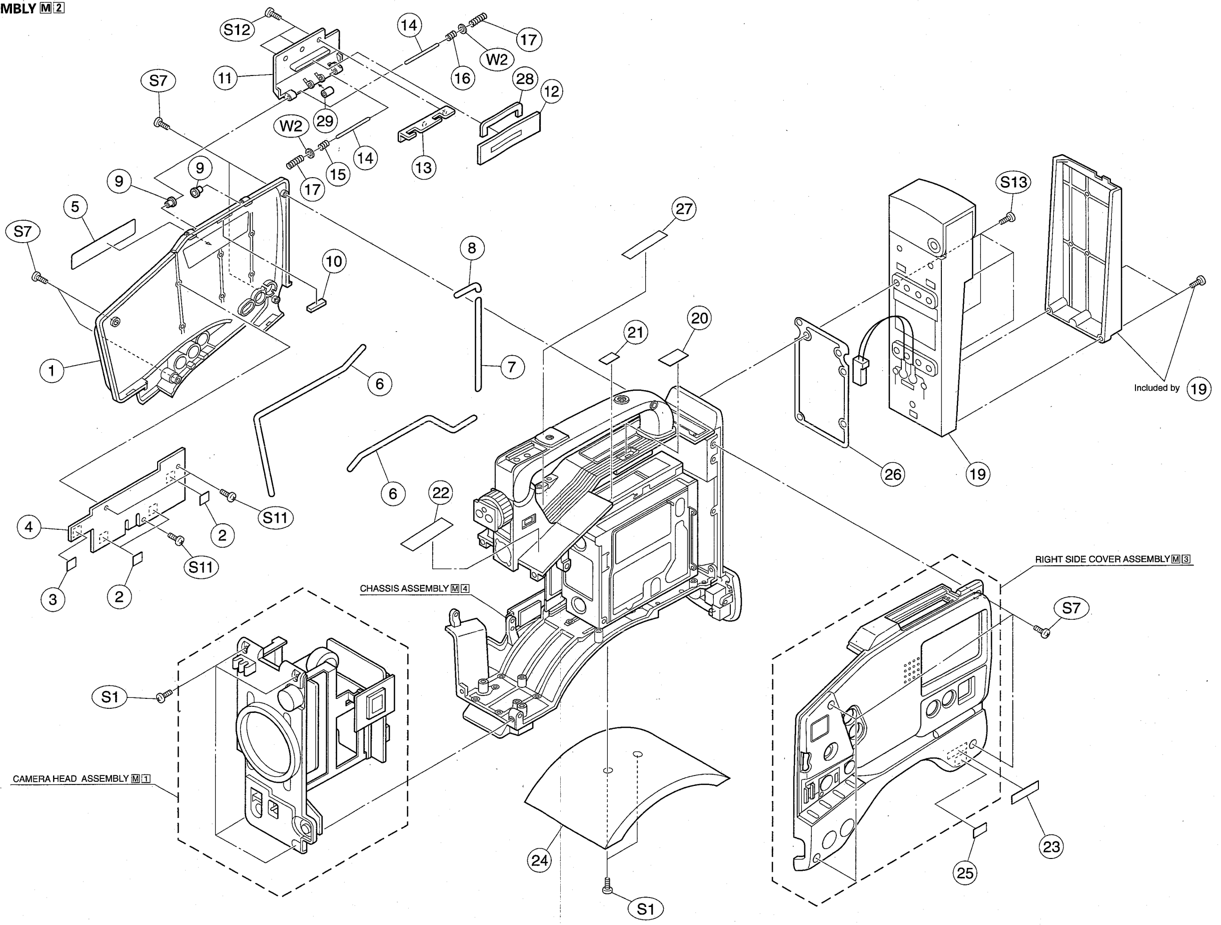
5.2 CABINET ASSEMBLY M2


S12
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Included by 19
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S11
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S11
3
2
RIGHT SIDE COVER ASSEMBLY M3
CHASSIS ASSEMBLY M4
S7
S1
CAMERA HEAD ASSEMBLY M1
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23
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S1

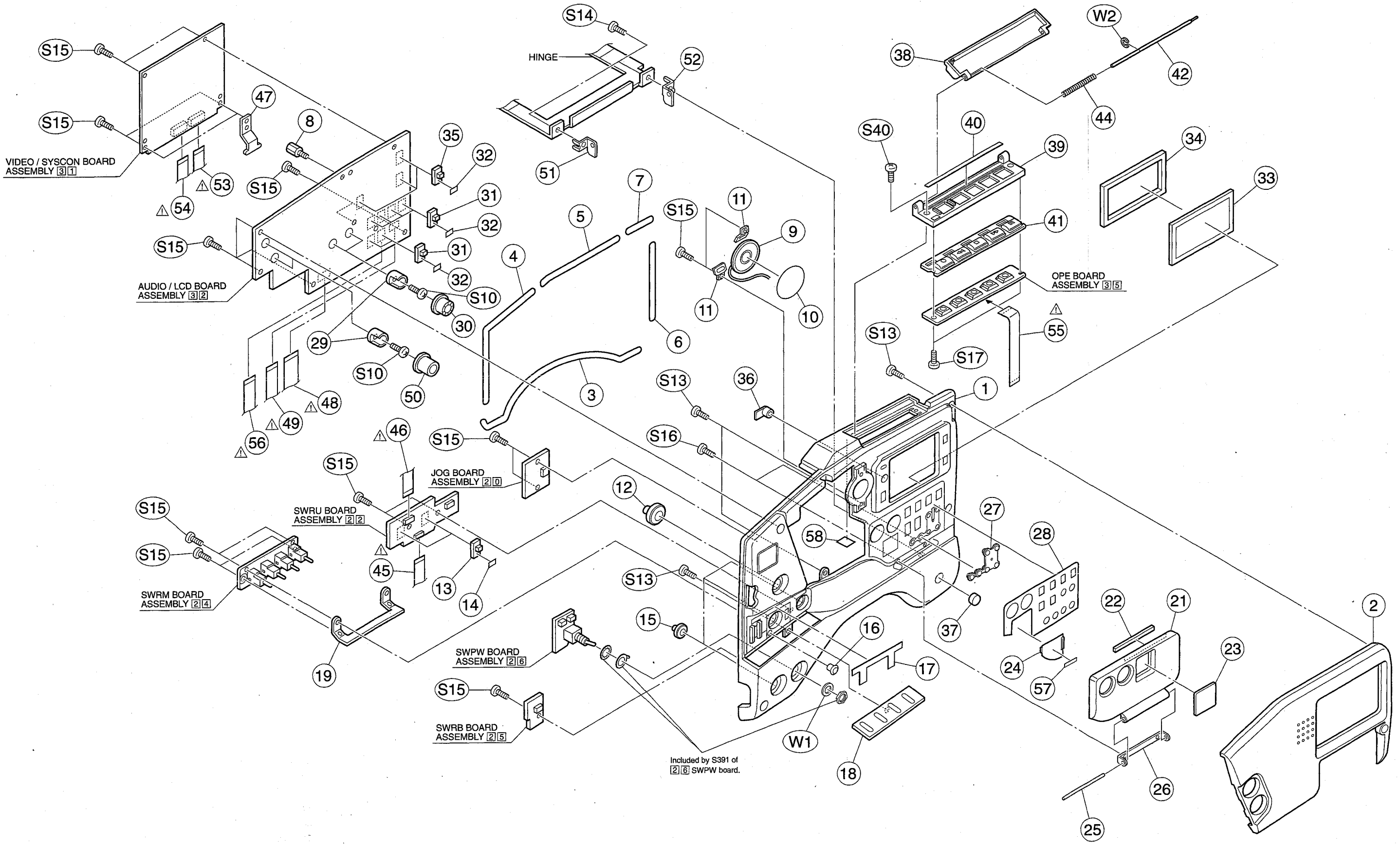
■ CABINET ASSEMBLY PARTS LIST M2

Symbol No.	Part No.	Part Name	Description
1	SC10239-021	L.SIDE COVER	
2	SC46265-004	RUBBER SHEET	
3	SC46265-009	RUBBER SHEET	
4	SC32326-001	HEAT SINK	
5	SC32285-001	ESCUT.PLATE	
6	SC46410-210	GASKET	
7	SC46410-115	GASKET	
8	SC46410-035	GASKET	
9	SC46549-001	BUSHING	
10	SC46555-001	CUSHION	
11	SC20723-002	CASSETTE COVER	
12	SC46541-001	COVER PAD	
13	SC46542-001	LOCK BRACKET	
14	SC46543-001	HINGE SHAFT	
15	SC46540-011	TORSION SPRING	
16	SC46540-012	TORSION SPRING	
17	SC46546-001	C.SPRING	
19	SCV2978-001	BATTERY HOLDER	
20	SC32311-301	NAME PLATE	
21	SC45925-001	LABEL	(E)
22	PU54392-1	LABEL	(E)
23	SC43658-001	CAUTION LABEL	(U)
24	SC10241-001	SHOLDER PAD	
25	OZL1001-012	UL LABEL	(U)
26	SC46521-001	BH CUSHION	
27	SC46608-021	LABEL	
28	SC46590-001	COVER PAD (B)	
29	SC46593-001	COLLAR	
S1	QYSDSP3006M	SCREW	M3 x 6
S7	SC43397-009	SCREW	
S11	QYSPSPT2630M	SCREW	M2.6 x 3.0
S12	QYSPSPT2030M	SCREW	M2 x 3.0
S13	QYSDSP3008M	SCREW	M3 x 8
W2	QYREE1200X	E.RING	

■ RIGHT SIDE COVER ASSEMBLY PARTS LIST M3

Symbol No.	Part No.	Part Name	Description
1	SC10238-001	R.SIDE COVER	
2	SC10242-001	CHEEK PAD	
3	SC46410-290	GASKET	
4	SC46410-190	GASKET	
5	SC46410-130	GASKET	
6	SC46410-115	GASKET	
7	SC46410-035	GASKET	
8	SC44974-010	STUD	
9	SCV2903-001	SPEAKER	
10	SC46228-001	SHEET	
11	SC44537-001	SP.BRACKET	
12	SC45246-001	KNOB	
13	SC44556-011	TC.KNOB	
14	SC46397-001	PLATE	
15	SC44828-002	SWITCH CAP	
16	SC43451-001	LED LENS	
17	SC46503-002	LABEL	
18	SC32287-001	SW.NAME PLATE	
19	SC46547-001	BRACKET	
21	SC20722-001	PANEL COVER	
22	SC46539-001	RUBBER MAGNET	
23	SC46538-001	PANEL WINDOW	
24	SC46548-001	BATTERY COVER	
25	SC46231-002	PANEL SHAFT	
26	SC46579-001	SHAFT HOLDER	
27	SC46509-001	PANEL KNOB	
28	SC32288-001	AUDIO PANEL	
29	SC46536-001	KNOB SHAFT	
30	SC32289-001	VOLUME KNOB	
31	SC45245-011	SLIDE KNOB	
32	PRD42909-04	PLATE	
33	SC46510-001	PLATE(LCD)	
34	SC46511-001	LCD CUSHION	
35	PRD43835	KNOB(OPE)	
36	SC46508-001	SELECT KNOB	
37	SC46357-001	CUSHION	
38	SC32305-002	OPE.COVER(U)	
39	SC32306-002	OPE.COVER(B)	
40	SC46527-001	OPERATION PANEL	
41	SC32307-001	OPERATION KNOB	
42	SC46528-001	OPE.SHAFT	
44	SC46532-001	SPRING(1)	
⚠ 45	SCV2337-1005BD	FFC	SWRU TO SWRM
⚠ 46	SCV2803-1515B	FFC	SWRU TO IF
47	SC46545-001	BOARD HOLDER	
⚠ 48	SCV2803-4012B	FFC	AUD/LCD TO MOTH
⚠ 49	SCV2803-3012B	FFC	AUD/LCD TO MOTH
50	SC46537-001	VR.KNOB	
51	SC46584-001	STAY	
52	SC46584-002	STAY	
⚠ 53	SCV2803-4012B	FFC	S/V CN101 TO MO
⚠ 54	SCV2803-4012B	FFC	S/V CN401 TO MO
⚠ 55	SCV2337-0808BD	FFC	OPE TO AUD/LCD
⚠ 56	SCV2803-2008B	FFC	AU/LC TO SY/VI
57	SC46585-001	LABEL	
58	SC46610-001	SHEET	
S10	QYSPSPT1730M	SCREW	M1.7 x 3.0
S13	QYSDSF2606Z	SCREW	M2.6 x 6
S14	QYSDSP2606Z	SCREW	M2.6 x 6
S15	QYSDSP2604Z	SCREW	M2.6 x 4
S16	QYSDSP2604M	SCREW	M2.6 x 4
S17	QYSDSF2004M	SCREW	M2 x 4
S40	QYSPSPT2080M	SCREW	M2 x 5.0
W1	QYWWS629205Z	WASHER	
W2	QYREE1200X	E.RING	

5.3 RIGHT SIDE COVER ASSEMBLY M3


S15
S15
VIDEO / SYSCON BOARD ASSEMBLY 31
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⚠53
⚠54
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S15
AUDIO / LCD BOARD ASSEMBLY 32
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⚠48
⚠49
⚠56
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HINGE
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S15
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W2
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41
OPE BOARD ASSEMBLY 35
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⚠46
S15
JOG BOARD ASSEMBLY 20
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SWRU BOARD ASSEMBLY 22
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SWRM BOARD ASSEMBLY 24
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S13
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SWPW BOARD ASSEMBLY 26
S15
SWRB BOARD ASSEMBLY 25
W1
Included by S391 of 26 SWPW board.
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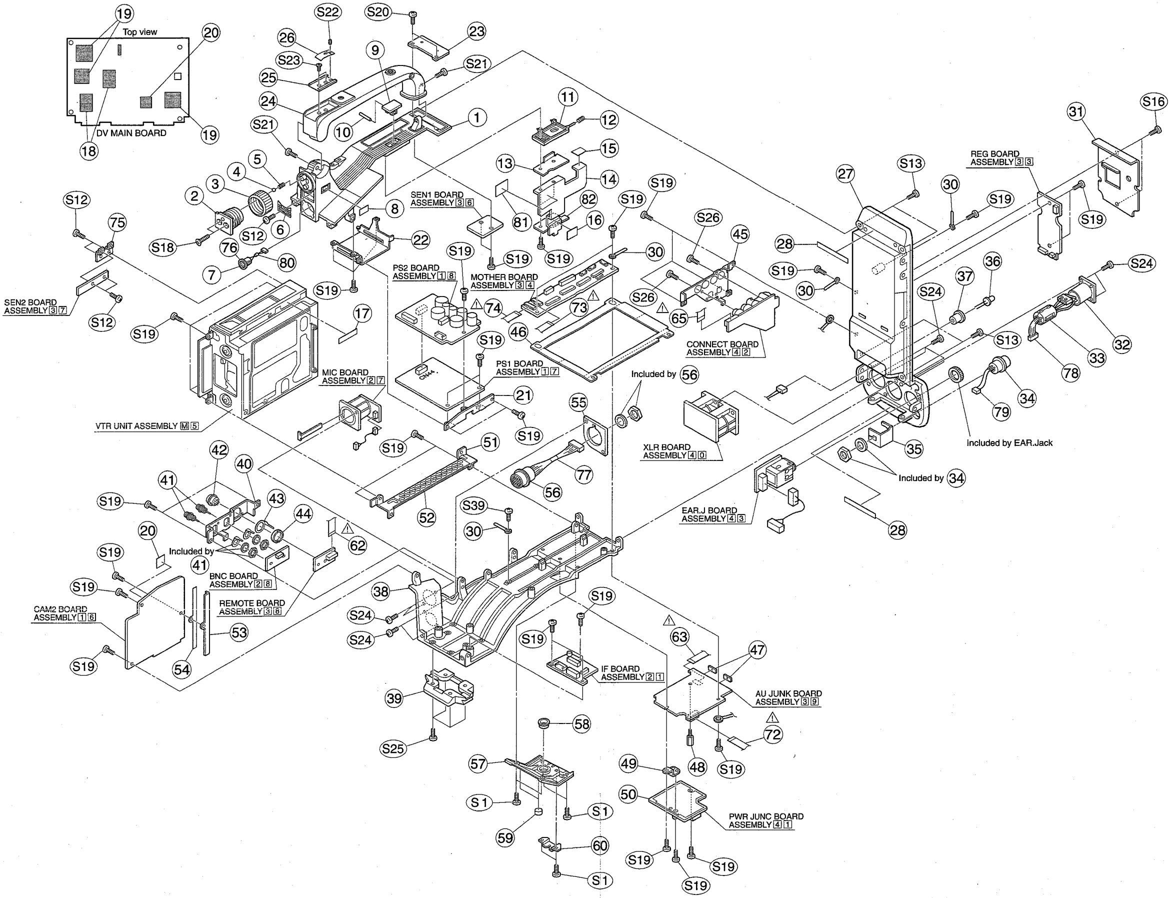
5.4 CHASSIS ASSEMBLY M4


Top view
DV MAIN BOARD
SEN1 BOARD ASSEMBLY 3 6
SEN2 BOARD ASSEMBLY 3 7
PS2 BOARD ASSEMBLY 1 8
MOTHER BOARD ASSEMBLY 3 4
PS1 BOARD ASSEMBLY 1 7
MIC BOARD ASSEMBLY 2 7
VTR UNIT ASSEMBLY M 5
CONNECT BOARD ASSEMBLY 4 2
REG BOARD ASSEMBLY 3 3
Included by 56
XLR BOARD ASSEMBLY 4 0
EAR.J BOARD ASSEMBLY 4 3
Included by EAR.Jack
Included by 34
Included by 41
BNC BOARD ASSEMBLY 2 8
REMOTE BOARD ASSEMBLY 3 6
CAM2 BOARD ASSEMBLY 1 6
IF BOARD ASSEMBLY 2 1
AU JUNK BOARD ASSEMBLY 3 9
PWR JUNC BOARD ASSEMBLY 4 1
CN44
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■ CHASSIS ASSEMBLY PARTS LIST M 4

M 4 M M ☐ ☐ ☐ ☐

Symbol No.	Part No.	Part Name	Description
1	SC10236-001	TOP FRAME	
2	SC31861-001-K	VF BASE	
3	SC45127-002	VF RING	
4	SC40465-045	STEEL BALL	
5	SC45107-001	SPRING	
6	SC46531-001	PLATE	
7	SCV0238-06S	CONNECTOR	
8	SC46544-001	PLATE	
9	SC46529-001	EJECT KNOB	
10	QYPRE1408	SPRING PIN	
11	SC32312-001	SLIDE PLATE	
12	SC46533-001	SPRING(2)	
13	SC46525-001	SLIDE COVER	
14	SC32327-001	HEAT SINK	
15	SC46265-007	RUBBER SHEET	
16	SC46265-005	RUBBER SHEET	
17	SC46592-001	AL SHEET	
18	SC46265-006	RUBBER SHEET	
19	SC46265-007	RUBBER SHEET	
20	SC46265-008	RUBBER SHEET	
21	SC46526-001	PS BRACKET	
22	SC32304-001	RAIL BRACKET	
23	SC32303-001	REAR COVER	
24	SC10240-002	HANDLE ASSEMBLY	
25	SC40886-001	SHOE	
26	SC40936	SPRING	
27	SC10237-001	REAR FRAME	
28	SC44847-050	SHIELD TUBE	
30	PU49485-4	WIRE CLAMP	
31	SC46513-001	REAR PLATE	
32	QNZ0429-001	CONNECTOR	
33	QQR0490-001	FILTER	
34	QNZ0257-001	CONNECTOR(4S)	
35	SC46566-001	CN SHEET	
36	SLR-56VR5F	L.E.D.	
37	SM3512	L.E.D.MOUNT	
38	SC10235-001	BOTTOM FRAME	
39	SC20691-001	FRONT BASE	
40	SC32294-001	CN BRACKET(1)	
41	QNZ0187-001	BNC CONNECTOR	
42	QNZ0276-001	CONNECTOR	
43	SC45831-001	LUG	
44	SC45586-001	NUT	
45	SC32295-002	CN BRACKET(2)	
46	SC32290-002	HINGE	
47	SC46522-001	SHEET	
48	SC44974-007	STUD	
49	SC46552-001	JUNC BRACKET	
50	SC46556-001	JUNC SHEET	
51	SC32293-001	VTR BRACKET	
52	SC46074-005	BRACKET SHEET	
53	SC46553-001	CAM2 BRACKET	
54	SC46567-001	CAM2 SHEET	
55	SC46554-001	LENS BRACKET	
56	SCV1938-12S	LENS CONNECTOR	
57	SC10244-001	BOTTOM COVER	
58	SC46519-001	KNOB	BRAKER
59	SC46520-001	CAP	
60	SC46242-002	REAR BASE	
⚠ 62	SCV2337-0610BD	FFC	REMOTE TO MOTH

Symbol No.	Part No.	Part Name	Description
⚠ 63	SCV2337-1005BD	FFC	XLR TO AU.JUNK
⚠ 65	SCV2337-1612BD	FFC	CONNECTOR TO MO
⚠ 72	SCV2803-2008B	FFC	AU.JUNK TO MOTH
⚠ 73	SCV2803-3318B	FFC	PGS30551A-01
⚠ 74	SCV2803-3030B	FFC	PGS30552A-02
75	SC46551-001	SENSOR BRACKET	
76	MLSC0710	VF WIRE	
77	MLSC0709	LENS WIRE	
78	MLSL149A	DC INPUT WIRE	
79	MLSL148A	DC OUT WIRE	
80	SCV2728-001	FERRITE CORE	
81	–	LABEL	S.S.F.
82	SC46589-001	SHEET	
S1	QYSDSP3006M	SCREW	M3 x 6
S12	QYSPSPT2030M	SCREW	M2 x 3.0
S13	QYSDSP3008M	SCREW	M3 x 8
S15	QYSDSP2604Z	SCREW	M2.6 x 4
S16	QYSDSP2604M	SCREW	M2.6 x 5
S18	QYYYSP4025M	BOLT	
S19	QYSDSP2605Z	SCREW	M2.6 x 5
S20	QYSPSP3006M	SCREW	M3 x 6
S21	QYSPSP5012M	SCREW	M5 x 12
S22	SC44821-001	SCREW	
S23	QYSSSP3006N	SCREW	M3 x 6
S24	QYSPSP2606N	SCREW	M2.6 x 6
S25	QYSSSP4006N	SCREW	M4 x 6
S26	QYSDSF3006M	SCREW	M3 x 6
S39	QYSDST3005Z	SCREW	M3 x 5

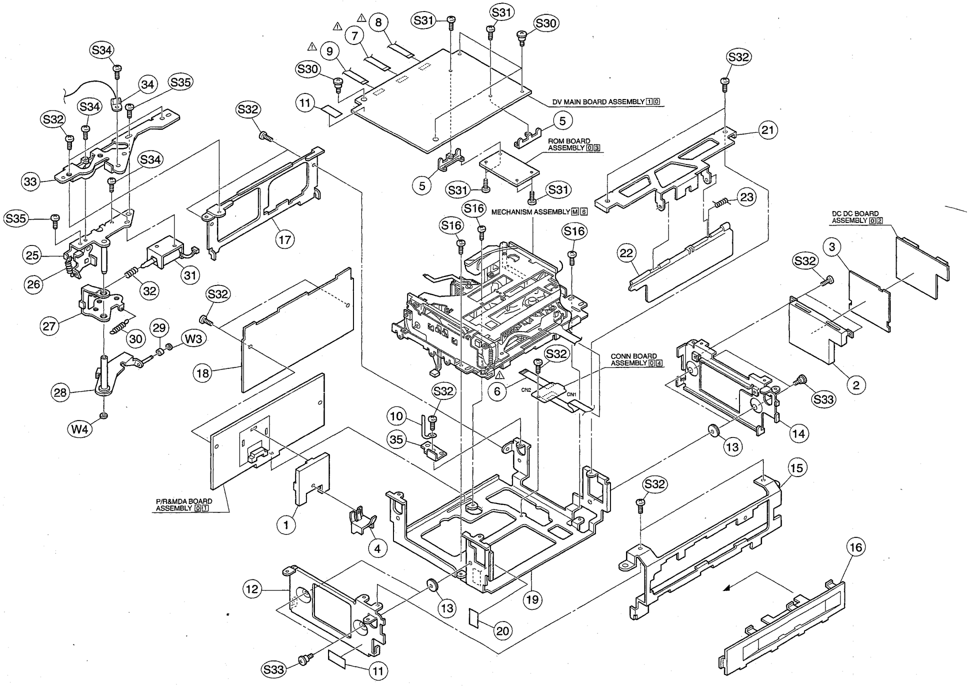
■ VTR UNIT ASSEMBLY PARTS LIST M5

M5MM☐☐☐☐

Symbol No.	Part No.	Part Name	Description
1	PRD31397	SHIELD CASE(P/R)	
2	PRD31398	SHIELD CASE(DC)	
3	PRD45263	INSULATOR	
4	PRD45247	EARTH PLATE	
5	PRD45259	P.W.B.BRACKET	
⚠ 6	SCV2803-1810B	FFC WIRE	MAIN401-JUNC
⚠ 7	SCV2803-2003B	FFC WIRE	MAIN 402-PR606
⚠ 8	SCV2803-2003B	FFC WIRE	MAIN 501-PR901
⚠ 9	SCV2803-1003B	FFC WIRE	MAIN 108-PR608
10	PU49485-3	WIRE CLAMP	
11	–	LABEL	IEEE1394 ID
12	PRD31393	SIDE COVER(L)	
13	PGZ02634	DAMPER	
14	PRD31394	SIDE COVER(R)	
15	PRD31395	FRONT COVER	
16	PRD31409	CASSETTE SLOT	
17	PRD31396	REAR COVER	
18	PRD45262	INSULATOR	
19	PRD20680	BASE FRAME	
20	PRD30030-127	PAD	
21	PRD31390-01-01	FRONT FRAME	
22	PRD31391	C.H.DOOR	
23	LP40360-001A	TORSION SPRING	
25	PRD31399A	CLEANER BKT.ASSEMBLY	
26	PRD30024-107	TENSION SPRING	
27	PRD31401	DRIVE ARM	
28	PRD31402A-01	CLEANER ARM ASSEMBLY	
29	LY41249-001A	CLEANER ASSEMBLY	
30	PRD30024-107	TENSION SPRING	
31	PGZ02629	DC-SOLENOID	

Symbol No.	Part No.	Part Name	Description
32	PRD30023-65	COMPRESS SPRING	
33	PRD31392	REAR FRAME	
34	QSD0002-001	DEW SENSOR	
35	PRD45284	BRACKET(C.H.)	
S16	QYSDSP2604Z	SCREW	M2.6 x 4
S30	PRD44099	SCREW	
S31	QYSDSP2003Z	SCREW	M2 x 3
S32	QYSDSP2005Z	SCREW	M2 x 5
S33	PRD45246	SCREW	
S34	QYSPSP2003Z	SCREW	M2 x 3
S35	QYSDSP2006Z	SCREW	M2 x 6
S41	QYSDSF2005Z	SCREW	M2 x 5
W3	YQ44246-3	SLIT WASHER	
W4	PQM30017-27	SLIT WASHER	

5.5 VTR UNIT ASSEMBLY M5


⚠ 8
⚠ 7
⚠ 9
S31
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S30
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11
DV MAIN BOARD ASSEMBLY 10
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ROM BOARD ASSEMBLY 03
S31
S31
S16
S16
S16
MECHANISM ASSEMBLY M6
S32
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DC DC BOARD ASSEMBLY 02
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S32
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CONN BOARD ASSEMBLY 04
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⚠ 6
CN2
CN1
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P/R&MDA BOARD ASSEMBLY 01
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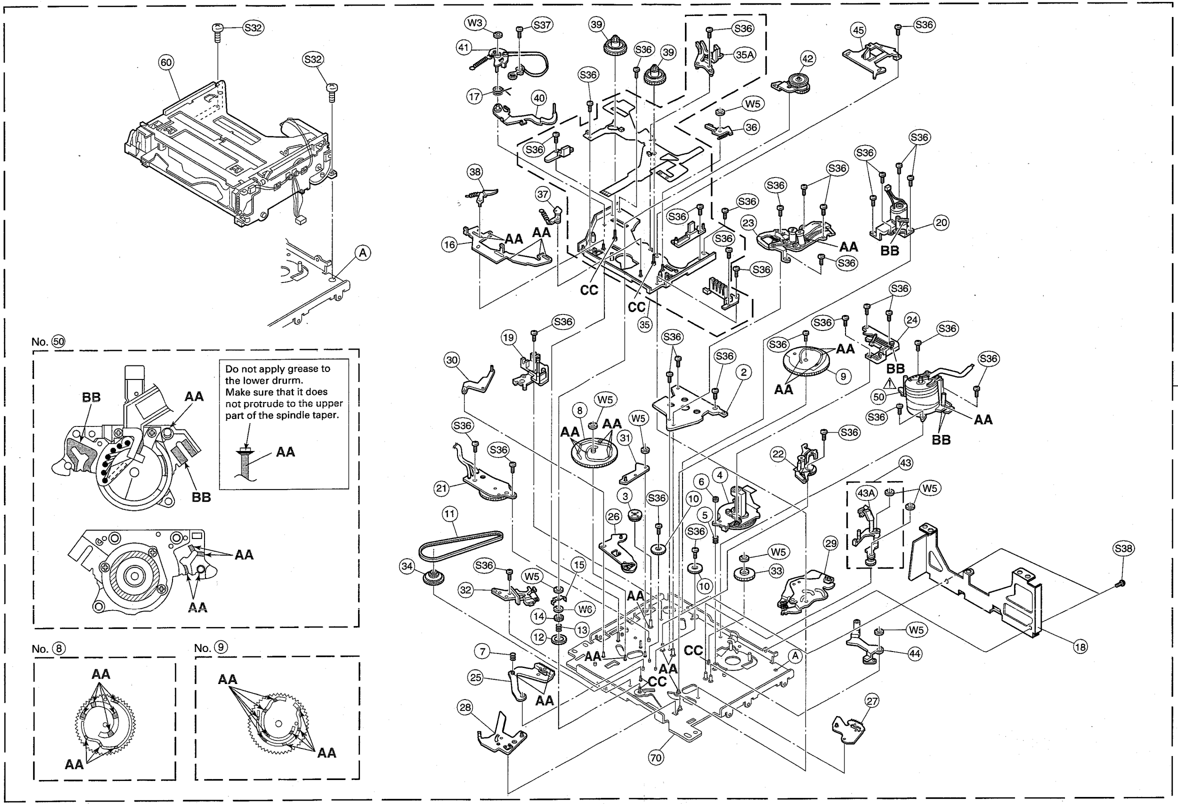
5.6 MECHANISM ASSEMBLY M6


S32
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Do not apply grease to the lower drurm.
Make sure that it does not protrude to the upper part of the spindle taper.

Classifi-cation	Part No.	Symbol in drawing
Grease	KYODO-SH-P	**AA**
Grease	RX-410R	**BB**
Oil	YTU94027	**CC**

NOTES:
- This section indicates that the grease and oil are to be applied on locations marked with **AA**, **BB** and **CC**.
During checking and servicing, check if grease has been applied on the locations marked with **AA**, **BB** and oil on the locations marked with **CC**.
- Apply also grease and oil on some locations in the main cam gear and the cam groove at the rear side of the sub cam gear.

■ MECHANISM ASSEMBLY PARTS LIST M 6

M 6 M M ☐☐☐☐

Symbol No.	Part No.	Part Name	Description
1	YMA0026A	MECHA ASSEMBLY	
2	LY30358-001A	DRUM BASE DECK	
3	LY30343-001A	WORM WHEEL 2	
4	QAR0012-002	CAPSTAN MOTOR	
5	LY30002-003A	COMPRES.SPRING	
6	LY41390-001A	ADJUST NUT	
7	LY40224-001A	COLLAR	
8	LY10060-002A	MAIN CAM	
9	LY20102-001A	SUB CAM	
10	YQ44560-1-2	CONNECT GEAR 2	
11	LY40241-001A	TIMING BELT	
12	LY40246-001A	C.LOCK GEAR(1)	
13	LY30002-009A	COMPRES.SPRING	
14	LY40247-001A	C.LOCK GEAR(2)	
15	LY40248-001A	PUSH PLATE	
16	LY20109-001B	CONTROL PLATE	
17	LY41243-001A	TOR.SPRING	
18	PRD31418	A.H.C.FRAME	
19	LY40237-001C	ENT.G.BASE ASSEMBLY	
20	LY30340-003A	MOTOR BKT.ASSEMBLY	
21	LY41190-002A	ROTARY EN.ASSEMBLY	
22	YQ31873C	G.RAIL(S) ASSEMBLY	
23	LY20097-001B	G.RAIL(T) ASSEMBLY	
24	LY30345-001A	M.CATCHER ASSEMBLY	
25	LY40223-001A	ARM GEAR 1 ASSEMBLY	
26	LY40235-002B	CENT.ARM ASSEMBLY	
27	LY40279-001A	ARM GEAR 2 ASSEMBLY	
28	LY40228-001A	C.LOCK LEVER ASSEMBLY	
29	LY30347-001A	CHARGE ARM ASSEMBLY	
30	LY40236-001A	T.CTL.ARM ASSEMBLY	
31	LY40233-001A	B.CTL.ARM ASSEMBLY	
32	LY40242-001C	BASE PLATE ASSEMBLY	
33	YQ43931A	R.D.PULLEY ASSEMBLY	
34	LY40239-003A	CENT.GEAR ASSEMBLY	
35	LYH30012-001A	S.DECK ASSEMBLY(G)	
35A	LY20108-001B	LED PRISM	
36	LY40257-001A	SUB BRAKE ASSEMBLY	
37	LY40259-001A	M.BRAKE(T) ASSEMBLY	
38	LY40260-003A	M.BRAKE(S) ASSEMBLY	
39	LY40255-001A	REEL DISK ASSEMBLY	
40	LY41245-001B	TENSION ARM SA.	
41	LY41246-003B	B.ARM PLATE SA.	
42	LY30370-002A	SWING ARM ASSEMBLY	
43	LY30380-001D	EXIT G.ARM ASSEMBLY	
43A	LY41250-001A	CLEAN.ARM ASSEMBLY	
44	LY30374-001B	P.R.ARM ASSEMBLY	
45	LY40280-003A	REEL COVER ASSEMBLY	
⚠ 50	YDV2093A	DRUM ASSEMBLY	
60	LY30428-003C	C.HOUSING ASSEMBLY	
70	LY10062-001B	MAIN DECK ASSEMBLY	
S32	QYSDSP2005Z	SCREW	M2 x 5
S36	YQ43893	SCREW	M1.4 x 2
S37	YQ43893-7	SCREW	M1.4 x 2
S38	QYSDSP2002N	SCREW	M2 x 2
W3	YQ44246-3	SLIT WASHER	
W5	YQ44246	SLIT WASHER	
W6	YQ43933-2	WASHER	

SECTION 6
ELECTRICAL PARTS LIST

SAFETY PRECAUTION:
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified parts numbers.
For maximum reliability and performance, all other replacement parts should be identical to those specified.

NOTE:
- Parts not denoted by parts numbers are not supplied by JVC.
- Abbreviations in this list are as follows:

RESISTORS
In the "Description" column:
All resistance values are in ohms ( ).
k expresses kilo-ohm (1 000 ohms, k).
M expresses mega-ohm (10^6 ohms, M).

In the "Parts Name"column:
CAR.RESISTOR : Carbon Resistor
C.M.F.RESISTOR : Constant Metalized Film Resistor
COMP.RESISTOR: Composition Resistor
FUSI.RESISTOR : Fusible Resistor
M.F.RESISTOR : Metal Film Resistor
M.G.RESISTOR : Metal Graze Resistor
M.P.RESISTOR : Metal Plate Resistor
O.M.F.RESISTOR : Oxide Metalized Film Resistor
TRIM.RESISTOR : Trimerer Resistor
U.F.RESISTOR : Non-inflammable Resistor
VAL.RESISTOR : Valiable Resistor
W.W.RESISTOR : Wire Wound Resistor

CAPACITORS
In the "Description" column:
All capacitance values are in microfarad (μF) unless otherwise indicated.
p expresses picofarad (10^{-12} farad,pF).

In the "Parts Name" column:
CER.CAPACITOR : Ceramic Capacitor
E.CAPACITOR : Electrolytic Capacitor
FILM CAPACITOR : Film Capacitor
M.F.CAPACITOR : Metalized Film Capacitor
MICA CAPACITOR : Mica Capacitor
MPP CAPACITOR : Metalized PolyPropylene Capacitor
MPPS CAPACITOR : Metalized PolyPhenylene Sulfied film Capacitor
M.M.CAPACITOR : Metalized Mylar Capacitor
MYLAR CAPACITOR : Mylar Capacitor
N.P.CAPACITOR : Non-Poler electrolytic Capacitor
P.P.CAPACITOR : PolyPropylene Capacitor
PPS CAPACITOR : PolyPhenylene Sulfied film Capacitor
P.S.CAPACITOR : PolyStyrene Capacitor
TAN.CAPACITOR : Tantal Capacitor
TRIM.CAPACITOR : Trimer Capacitor
VAL.CAPACITOR : Valiable Capacitor

Note: In the "Description" column of the parts list, (U) means the parts for the U version while (E) is for the E version.

Symbol No.	Part No.	Part Name	Description	
IC1	SCV1585-064	I.C.(M)	JVC (U)	← **for U version**
	SCV1585-067	I.C.(M)	JVC (E)	← **for E version**

6.1 PR & MDA BOARD ASSEMBLY PARTS LIST 01

SLK2088-01-00B 01☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC601	BA6865KV	I.C.(M)	ROHM	
IC602	BA6417F-X	I.C.(M)	ROHM	
IC603	BA6254FS-X	I.C.(M)	ROHM	
IC901	AN3731FHQ	I.C.(M)	MATSUSHITA	
Q601	DTC144EUA-X	TRANSISTOR	ROHM	
Q602	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q603	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q604	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q607	DTC144EUA-X	TRANSISTOR	ROHM	
Q608	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q903	2SC4226/3-5/-X	TRANSISTOR	NEC	
Q905	2SD1979/S/-X	TRANSISTOR	MATSUSHITA	
Q906	2SD1979/S/-X	TRANSISTOR	MATSUSHITA	
Q907	2SC4226/3-5/-X	TRANSISTOR	NEC	
D602	DAP202U-X	DIODE	ROHM	
D603	DAP202U-X	DIODE	ROHM	
D605	MA736-X	DIODE	MATSUSHITA	
R601	NRSA63J-681X	M.G.RESISTOR	680	1/16W
R602	NRSA63J-124X	M.G.RESISTOR	120k	1/16W
R603	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R604	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R605	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R606	NRV142F-R22X	C.M.F.RESISTOR	0.22	1/4W
R608	NRS12BJ-1R0W	M.G.RESISTOR	1	1/2W
R609	NRS12BJ-1R0W	M.G.RESISTOR	1	1/2W
R610	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R611	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R612	NRSA63J-274X	M.G.RESISTOR	270k	1/16W
R613	NRSA63J-272X	M.G.RESISTOR	2.7k	1/16W
R614	NRSA63J-154X	M.G.RESISTOR	150k	1/16W
R615	NRSA63J-474X	M.G.RESISTOR	470k	1/16W
R616	NRVA63D-202X	C.M.F.RESISTOR	2k	1/16W
R617	NRSA63J-563X	M.G.RESISTOR	56k	1/16W
R618	NRSA63J-203X	M.G.RESISTOR	20k	1/16W
R619	NRSA63J-393X	M.G.RESISTOR	39k	1/16W
R625	NRSA63J-511X	M.G.RESISTOR	510	1/16W
R626	NRSA63J-511X	M.G.RESISTOR	510	1/16W
R627	NRSA63J-511X	M.G.RESISTOR	510	1/16W
R628	NRSA63J-511X	M.G.RESISTOR	510	1/16W
R629	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R630	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R631	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R634	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R635	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R636	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R642	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R643	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R646	NRSA63J-393X	M.G.RESISTOR	39k	1/16W
R649	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R650	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R652	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R657	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R658	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R661	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R662	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R663	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R903	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R904	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R905	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R906	NRSA63J-122X	M.G.RESISTOR	1.2k	1/16W
R907	NRSA63J-100X	M.G.RESISTOR	10	1/16W
R909	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R911	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R912	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R913	NRSA63J-680X	M.G.RESISTOR	68	1/16W
R914	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R915	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R916	NRSA63J-271X	M.G.RESISTOR	270	1/16W
R917	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R921	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R922	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R923	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R924	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R925	NRSA63J-680X	M.G.RESISTOR	68	1/16W
R926	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R927	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R928	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R932	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
C601	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C602	NCB41CM-106X	CER.CAPACITOR	10	16V
C603	NBE21AM-106X	TAN.CAPACITOR	10	10V
C605	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C606	NCB31HK-152X	CER.CAPACITOR	1500p	50V
C607	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C608	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C609	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C610	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C611	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C612	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C613	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C614	NBE71VM-106X	TAN.CAPACITOR	10	35V
C615	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C616	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C617	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C618	NCB31EK-223X	CER.CAPACITOR	0.022	25V
C619	NCB31EK-223X	CER.CAPACITOR	0.022	25V
C620	NCB31EK-223X	CER.CAPACITOR	0.022	25V
C621	NCB21AK-105X	CER.CAPACITOR	1	10V
C622	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C623	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C625	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C626	NCB31EK-223X	CER.CAPACITOR	0.022	25V
C627	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C628	NCB21EK-104X	CER.CAPACITOR	0.1	25V
C631	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C632	NBE51CM-226X	TAN.CAPACITOR	22	16V
C635	NBE71VM-106X	TAN.CAPACITOR	10	35V
C636	NCB41CM-106X	CER.CAPACITOR	10	16V
C637	NCB41CM-106X	CER.CAPACITOR	10	16V
C639	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C640	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C641	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C644	NCB21EK-104X	CER.CAPACITOR	0.1	25V
C646	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C647	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C648	NCB21CK-224X	CER.CAPACITOR	0.22	16V
C649	NCB21CK-224X	CER.CAPACITOR	0.22	16V
C650	NCB21CK-224X	CER.CAPACITOR	0.22	16V
C651	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C652	NBE71VM-106X	TAN.CAPACITOR	10	35V
C653	NCF31CZ-334X	CER.CAPACITOR	0.33	16V
C654	NCF31CZ-334X	CER.CAPACITOR	0.33	16V
C901	NCB31HK-122X	CER.CAPACITOR	1200p	50V
C902	NCB21AK-105X	CER.CAPACITOR	1	10V
C903	NCB31HK-102X	CER.CAPACITOR	1000p	50V
C904	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C905	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C906	NDC31HJ-470X	CER.CAPACITOR	47p	50V
C907	NCB31HK-681X	CER.CAPACITOR	680p	50V
C909	NCB31HK-152X	CER.CAPACITOR	1500p	50V
C910	NDC31HJ-330X	CER.CAPACITOR	33p	50V
C911	NBE20JM-106X	TAN.CAPACITOR	10	6.3V
C912	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C913	NBE61AM-107X	TAN.CAPACITOR	100	10V
C914	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C915	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C916	NDC31HJ-220X	CER.CAPACITOR	22p	50V
C917	NBE71VM-106X	TAN.CAPACITOR	10	35V
C918	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C919	NCB31HK-103X	CER.CAPACITOR	0.01	50V

[PR & MDA]

Symbol No.	Part No.	Part Name	Description	
C920	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C921	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C922	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C924	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C927	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C929	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
C930	NBE50JM-107X	TAN.CAPACITOR	100	6.3V
C931	NBE21AM-106X	TAN.CAPACITOR	10	10V
C932	NBE21AM-106X	TAN.CAPACITOR	10	10V
C933	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C934	NDC31HJ-330X	CER.CAPACITOR	33p	50V
C935	NBE20JM-106X	TAN.CAPACITOR	10	6.3V
C936	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C938	NCB31HK-152X	CER.CAPACITOR	1500p	50V
C940	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C943	NCB31HK-103X	CER.CAPACITOR	0.01	50V
L901	NQL044K-470X	COIL	47uH	
L902	NQL044K-221X	COIL	220uH	
L903	NQL044K-470X	COIL	47uH	
L904	NQL085J-220X	COIL	22uH	
L905	NQL085J-220X	COIL	22uH	
LC601	PGZ01972Z	LC FILTER		
LC602	PGZ01972Z	LC FILTER		
LC603	PGZ01972Z	LC FILTER		
LC605	PGZ01972Z	LC FILTER		
CN601	QGA1201F2-08X	CONNECTOR	8PIN	
CN602	QGA1201C2-02X	CONNECTOR	2PIN	
CN603	QGF0508F1-11X	CONNECTOR	11PIN	
CN604	QGF0504C1-18X	CONNECTOR	18PIN	
CN605	QGA1201F2-04X	CONNECTOR	4PIN	
CN606	QGF0508F1-20X	CONNECTOR	20PIN	
CN607	QGA1201C2-04X	CONNECTOR	4PIN	
CN608	QGF0508F1-10X	CONNECTOR	10PIN	
CN609	QGA1201F2-02X	CONNECTOR	2PIN	
CN610	QGA2001F2-02X	CONNECTOR	2PIN	
CN901	QGF0508F1-20X	CONNECTOR	20PIN	
CN902	QGF0504C1-10X	CONNECTOR	10PIN	

6.2 DCDC BOARD ASSEMBLY PARTS LIST 02

SLK2088-02-00A 02☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC1	BA9738KV	I.C.(M)	ROHM	
Q2	DTC144EUA-X	TRANSISTOR	ROHM	
Q3	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q4	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q5	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q6	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q7	2SB1302/ST/-X	TRANSISTOR	SANYO	
Q8	2SB1302/ST/-X	TRANSISTOR	SANYO	
D1	SFPB-72-W	DIODE	SANKEN	
D2	SFPB-72-W	DIODE	SANKEN	
D3	SFPB-72-W	DIODE	SANKEN	
D4	SFPB-72-W	DIODE	SANKEN	
D5	SFPB-72-W	DIODE	SANKEN	
D6	SFPB-72-W	DIODE	SANKEN	
D7	DAN202U-X	DIODE	ROHM	
R1	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R2	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R3	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R5	NRSA63J-272X	M.G.RESISTOR	2.7k	1/16W
R6	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R7	NRSA63J-682X	M.G.RESISTOR	6.8k	1/16W
R8	NRSA63J-823X	M.G.RESISTOR	82k	1/16W
R9	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R10	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R11	NRSA63J-122X	M.G.RESISTOR	1.2k	1/16W
R14	NRSA63J-122X	M.G.RESISTOR	1.2k	1/16W
R15	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R16	NRSA63J-682X	M.G.RESISTOR	6.8k	1/16W
R17	NRSA63J-823X	M.G.RESISTOR	82k	1/16W
R18	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R19	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R20	NRSA63J-272X	M.G.RESISTOR	2.7k	1/16W
R21	NRSA63D-243X	M.G.RESISTOR	24k	1/16W
R22	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R23	NRSA63D-153X	M.G.RESISTOR	15k	1/16W
R24	NRSA63D-123X	M.G.RESISTOR	12k	1/16W
R25	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R26	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R27	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R28	NRSA63D-153X	M.G.RESISTOR	15k	1/16W
R29	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R30	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
R31	NRSA63D-822X	M.G.RESISTOR	8.2k	1/16W
R32	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R33	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
R34	NRSA63D-153X	M.G.RESISTOR	15k	1/16W
R35	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R36	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R37	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R38	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R39	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R40	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R41	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R42	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R43	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R44	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R45	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R46	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R47	NRSA63J-331X	M.G.RESISTOR	330	1/16W
R48	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R49	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R50	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R51	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R52	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R53	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R54	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R55	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R56	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R58	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W

Symbol No.	Part No.	Part Name	Description
C1	NCB21AK-105X	CER.CAPACITOR	1 10V
C2	NCB21AK-105X	CER.CAPACITOR	1 10V
C3	NCB21AK-105X	CER.CAPACITOR	1 10V
C4	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C5	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C6	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C7	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C8	NCB21CK-224X	CER.CAPACITOR	0.22 16V
C9	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C10	NCB11AK-225X	CER.CAPACITOR	2.2 10V
C11	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C12	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C13	NCB31HK-331X	CER.CAPACITOR	330p 50V
C14	NDC31HJ-181X	CER.CAPACITOR	180p 50V
C15	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C16	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C17	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C18	NCB31HK-472X	CER.CAPACITOR	4700p 50V
C19	NCB31HK-103X	CER.CAPACITOR	0.01 50V
C20	NCB31HK-103X	CER.CAPACITOR	0.01 50V
C21	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C22	NDC31HJ-101X	CER.CAPACITOR	100p 50V
C23	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C24	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C25	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C26	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C27	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C28	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C30	NCB21AK-105X	CER.CAPACITOR	1 10V
C31	NCB21AK-105X	CER.CAPACITOR	1 10V
C32	NCB11AK-475X	CER.CAPACITOR	4.7 10V
C33	NCB21AK-105X	CER.CAPACITOR	1 10V
C34	NCB11AK-475X	CER.CAPACITOR	4.7 10V
C35	NCB21AK-105X	CER.CAPACITOR	1 10V
C36	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C37	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C38	NCB21AK-105X	CER.CAPACITOR	1 10V
C39	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C40	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C41	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C42	NCB21AK-105X	CER.CAPACITOR	1 10V
C43	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C44	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C45	NCB21AK-105X	CER.CAPACITOR	1 10V
C46	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C47	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C48	NCB10JK-106X	CER.CAPACITOR	10 6.3V
C49	NCB41CM-106X	CER.CAPACITOR	10 16V
C50	NCB41CM-106X	CER.CAPACITOR	10 16V
L1	NQL23CM-330X	COIL	33uH
L2	NQL23CM-330X	COIL	33uH
L3	NQL23CM-330X	COIL	33uH
L4	NQL24CN-220X	COIL	22uH
L5	NQL25CM-330X	COIL	33uH
L6	NQL25CM-330X	COIL	33uH
L7	NQL23CM-330X	COIL	33uH
L8	NQL24CN-220X	COIL	22uH
L9	NQL35BK-100X	COIL	10uH
L10	NQL35BK-100X	COIL	10uH
L11	NQL24CN-220X	COIL	22uH
L12	NQL23CM-330X	COIL	33uH
L13	NQL24CN-220X	COIL	22uH
L14	NQL35BK-100X	COIL	10uH
L15	NQL35BK-100X	COIL	10uH
CN1	QGA1201F2-13X	CONNECTOR	13PIN
CN2	QGA1201F2-08X	CONNECTOR	8PIN
⚠CP11	ICP-S2.3TN	ICP	
⚠CP12	ICP-S2.3TN	ICP	
⚠CP13	ICP-S2.3TN	ICP	

6.3 ROM BOARD ASSEMBLY PARTS LIST 0 3

SLK2088-03-U0C(U)

SLK2088-03-E0C(E) 0 3 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	M27W102-80N6-02	I.C.(M)	MITSUBISHI (U)
	M27W102-80N6-82	I.C.(M)	MITSUBISHI (E)
SK1	NNV0012-040	IC SOCKET	40PIN
IC2	74LCX16244MTD-X	I.C.(M)	NATIONAL SEMICO
IC3	74LCX16374MTD-X	I.C.(M)	NATIONAL SEMICO
IC4	TC7W00FU-X	I.C.(M)	TOSHIBA
IC5	TC7W04FU-X	I.C.(M)	TOSHIBA
R3	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R4	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R5	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R6	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
RA1	NRZ0015-473X	RESISTOR ARRAY	47k
RA2	NRZ0015-473X	RESISTOR ARRAY	47k
RA3	NRZ0015-473X	RESISTOR ARRAY	47k
RA4	NRZ0015-473X	RESISTOR ARRAY	47k
C1	NCF31CZ-104X	CER.CAPACITOR	0.1 16V
C2	NCF31CZ-104X	CER.CAPACITOR	0.1 16V
C3	NCF31CZ-104X	CER.CAPACITOR	0.1 16V
C4	NCF31CZ-104X	CER.CAPACITOR	0.1 16V
C5	NCF31CZ-104X	CER.CAPACITOR	0.1 16V
CN1	QGB0801M2-26X	CONNECTOR	26PIN
LA1	NRZ0015-0R0X	RESISTOR ARRAY	0
LA2	NRZ0015-0R0X	RESISTOR ARRAY	0
LA3	NRZ0015-0R0X	RESISTOR ARRAY	0
LA4	NRZ0015-0R0X	RESISTOR ARRAY	0

6.4 CONN. BOARD ASSEMBLY PARTS LIST 0 4

SLK2088-04-00A 0 4 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
R1	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
TH1	NAD0002-103X	THERMISTOR	10k
CN1	QGF0508F2-15X	CONNECTOR	15PIN
CN2	QGF0508F2-18X	CONNECTOR	18PIN

6.5 DV MAIN BOARD ASSEMBLY PARTS LIST 1 0

SLK2087-U0D(U)

SLK2087-E0D(E) 1 0 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC101	MN102F1617HL-25	I.C.(M)	MATSUSHITA	(U)
	MN102F1617HL-05	I.C.(M)	MATSUSHITA	(E)
IC103	X25057M8-2.7-X	I.C.(M)	XICOR	
IC105	S-80823ANNP-W	I.C.(M)	SEIKO	
IC106	NM24C16LEM8-X	I.C.(M)	MATSUSHITA	
IC107	SN74CBT3384APWX	I.C.(M)	TEXAS	
IC108	S-81240PG-PJ-X	I.C.(M)	SEIKO	
IC113	TC7W04FU-X	I.C.(M)	TOSHIBA	
IC201	AK4518-VF-X	I.C.(M)	ASAHI KASEI	
IC202	M5218AFP-X	I.C.(M)	MITSUBISHI	
IC301	MN67373	I.C.(M)	MATSUSHITA	
IC302	MN47V06AF	I.C.(M)	MATSUSHITA	(U)
	MN47V07AF	I.C.(M)	MATSUSHITA	(E)
IC303	M65500FP	I.C.(M)	MITSUBISHI	
IC304	MN41V4260TT-A07	I.C.(M)	MATSUSHITA	
IC305	AD9057BRS-60-X	I.C.(M)	FUJI ELECTRO	
IC306	PLL1700E-X	I.C.(M)	BURR BROWN	
IC307	UPC2384GA	I.C.(M)	NEC	
IC401	M31020EAVP-101	I.C.(M)	MITSUBISHI	(U)
	M31020EAVP-001	I.C.(M)	MITSUBISHI	(E)
IC402	TC7W14FU-X	I.C.(M)	TOSHIBA	
IC403	TC7W04FU-X	I.C.(M)	TOSHIBA	
IC404	NM24C16LEM8-XZB	I.C.(M)	MATSUSHITA	(U)
	NM24C16LEM8-X	I.C.(M)	MATSUSHITA	(E)
IC501	AN3741FAP-A	I.C.(M)	MATSUSHITA	
IC503	MB88345PF	I.C.(M)	FUJITSU	
IC601	BH7086KV	I.C.(M)	ROHM	
IC602	T9P90EF	I.C.(M)	TOSHIBA	
IC603	M52387FP	I.C.(M)	MITSUBISHI	
IC604	M52684AFP-XE	I.C.(M)	MITSUBISHI	
IC605	TC7SH08F-X	I.C.(M)	TOSHIBA	
IC606	TC7SH00F-X	I.C.(M)	TOSHIBA	
IC610	TC7SET04FU-X	I.C.(M)	TOSHIBA	
IC611	TC7SHU04FU-X	I.C.(M)	TOSHIBA	
IC612	TC7SHU04FU-X	I.C.(M)	TOSHIBA	
IC613	TC7SHU04FU-X	I.C.(M)	TOSHIBA	
IC614	TC7SHU04FU-X	I.C.(M)	TOSHIBA	
IC615	AN77L03M-X	I.C.(M)	MATSUSHITA	
IC801	TSB13LV11PBW	I.C.(M)	TEXAS	
Q101	2SC4617/RS/-X	TRANSISTOR	ROHM	
Q202	2SC4617/RS/-X	TRANSISTOR	ROHM	
Q401	DTA114EUA-X	TRANSISTOR	ROHM	
Q402	UMG3N-W	TRANSISTOR	ROHM	
Q403	UMC3N-W	TRANSISTOR	ROHM	
Q404	UMC3N-W	TRANSISTOR	ROHM	
Q501	2SC4226/3-5/-X	TRANSISTOR	NEC	
Q502	DTC124EUA-X	TRANSISTOR	ROHM	
Q503	2SC4617/RS/-X	TRANSISTOR	ROHM	
Q504	2SA1774/QRS/-X	TRANSISTOR	ROHM	
Q505	DTC144EUA-X	TRANSISTOR	ROHM	
Q506	DTC144EUA-X	TRANSISTOR	ROHM	
Q507	DTC144EUA-X	TRANSISTOR	ROHM	
Q511	2SA1774/QRS/-X	TRANSISTOR	ROHM	
Q512	DTC144EUA-X	TRANSISTOR	ROHM	
Q513	UMZ1N-W	TRANSISTOR	ROHM	
Q602	2SC4081/QRS/-X	TRANSISTOR	ROHM	
Q603	2SC4081/QRS/-X	TRANSISTOR	ROHM	
Q605	2SC4081/QRS/-X	TRANSISTOR	ROHM	
Q608	2SC4081/QRS/-X	TRANSISTOR	ROHM	
Q609	2SC4081/QRS/-X	TRANSISTOR	ROHM	
Q610	2SB1218A/RS/-X	TRANSISTOR	MATSUSHITA	
Q611	2SB1218A/RS/-X	TRANSISTOR	MATSUSHITA	
Q612	DTC144WUA-X	TRANSISTOR	ROHM	
Q613	DTC144WUA-X	TRANSISTOR	ROHM	
Q614	DTC144EUA-X	TRANSISTOR	ROHM	
D102	DAN202U-X	DIODE	ROHM	
D103	DAN202U-X	DIODE	ROHM	
D401	DAP202U-X	DIODE	ROHM	
D402	DAP202U-X	DIODE	ROHM	
D601	1SS355-X	DIODE	ROHM	

Symbol No.	Part No.	Part Name	Description	
R101	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R103	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R104	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R105	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R106	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R107	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R108	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R109	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R110	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R111	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R112	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R113	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R114	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R115	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R116	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R117	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R118	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R137	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R138	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R139	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R142	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R143	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R144	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R150	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R152	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R157	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R162	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R163	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R164	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R169	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R170	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R171	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R172	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R173	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R174	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R175	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R176	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R177	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R178	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R179	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R180	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R181	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R182	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R183	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R184	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R185	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R186	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R187	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R188	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R189	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R198	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R199	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R202	NRSA63J-100X	M.G.RESISTOR	10	1/16W
R207	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R208	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R209	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R210	NRSA63J-682X	M.G.RESISTOR	6.8k	1/16W
R211	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R212	NRSA63J-912X	M.G.RESISTOR	9.1k	1/16W
R214	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R215	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R216	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R217	NRSA63J-912X	M.G.RESISTOR	9.1k	1/16W
R218	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R219	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R221	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R223	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R301	NRSA63J-271X	M.G.RESISTOR	270	1/16W
R302	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R303	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R304	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R305	NRSA63J-105X	M.G.RESISTOR	1M	1/16W

Symbol No.	Part No.	Part Name	Description	
R306	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R307	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R308	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R309	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R310	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R311	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R312	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R313	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R314	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R315	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R316	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R317	NRSA63J-682X	M.G.RESISTOR	6.8k	1/16W
R319	NRSA63J-224X	M.G.RESISTOR	220k	1/16W
R320	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R321	NRSA63J-750X	M.G.RESISTOR	75	1/16W
R322	NRSA63J-124X	M.G.RESISTOR	120k	1/16W
R323	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R331	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R332	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R333	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R334	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R335	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R336	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R337	NRSA63J-562X	M.G.RESISTOR	5.6k	1/16W
R338	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R339	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R340	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R341	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R342	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R343	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R344	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R345	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R346	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R347	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R348	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R349	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R350	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R351	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R352	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R353	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R354	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R355	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R356	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R357	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R402	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R403	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R404	NRSA63J-220X	M.G.RESISTOR	22	1/16W
R405	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R406	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R407	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R408	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R409	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R410	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R411	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R412	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R413	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R414	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R415	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R416	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R417	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R418	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R419	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R420	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R421	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R422	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R423	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R424	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R425	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R426	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R427	NRSA63J-683X	M.G.RESISTOR	68k	1/16W
R428	NRSA63J-683X	M.G.RESISTOR	68k	1/16W
R429	NRSA63J-330X	M.G.RESISTOR	33	1/16W
R430	NRSA63J-101X	M.G.RESISTOR	100	1/16W

Symbol No.	Part No.	Part Name	Description	
R431	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R432	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R433	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R434	NRSA63J-561X	M.G.RESISTOR	560	1/16W
R435	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R436	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R437	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R438	NRSA63J-561X	M.G.RESISTOR	560	1/16W
R439	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R440	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R443	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R444	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R447	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R448	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R449	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R450	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R451	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R452	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R454	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R502	NRSA63J-181X	M.G.RESISTOR	180	1/16W
R503	NRSA63J-301X	M.G.RESISTOR	300	1/16W
R504	NRSA63J-391X	M.G.RESISTOR	390	1/16W
R505	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R507	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R508	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R509	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R510	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R512	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R513	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R514	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R515	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R516	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R517	NRSA63J-683X	M.G.RESISTOR	68k	1/16W
R518	NRSA63J-331X	M.G.RESISTOR	330	1/16W
R519	NRSA63J-562X	M.G.RESISTOR	5.6k	1/16W
R520	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R521	NRSA63J-391X	M.G.RESISTOR	390	1/16W
R522	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R523	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R524	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R525	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R526	NRSA63J-822X	M.G.RESISTOR	8.2k	1/16W
R527	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R528	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R529	NRSA63J-562X	M.G.RESISTOR	5.6k	1/16W
R530	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R533	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R534	NRSA63J-563X	M.G.RESISTOR	56k	1/16W
R535	NRSA63J-564X	M.G.RESISTOR	560k	1/16W
R536	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R537	NRSA63J-561X	M.G.RESISTOR	560	1/16W
R538	NRSA63J-224X	M.G.RESISTOR	220k	1/16W
R539	NRSA63J-680X	M.G.RESISTOR	68	1/16W
R540	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R541	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R555	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R556	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R564	NRSA63J-124X	M.G.RESISTOR	120k	1/16W
R565	NRSA63J-563X	M.G.RESISTOR	56k	1/16W
R566	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R567	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R568	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R601	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R602	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R603	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R604	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R605	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R606	NRSA63J-682X	M.G.RESISTOR	6.8k	1/16W
R607	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R608	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R609	NRSA63J-563X	M.G.RESISTOR	56k	1/16W
R610	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R611	NRSA63J-183X	M.G.RESISTOR	18k	1/16W

[DV MAIN]

Symbol No.	Part No.	Part Name	Description	
R612	NRSA63J-391X	M.G.RESISTOR	390	1/16W
R613	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R614	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R615	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W
R616	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R617	NRSA63J-153X	M.G.RESISTOR	15k	1/16W
R618	NRSA63J-183X	M.G.RESISTOR	18k	1/16W
R619	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R620	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R621	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R622	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R623	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R624	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R625	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R626	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R629	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R631	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R632	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R633	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R634	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R635	NRSA63J-183X	M.G.RESISTOR	18k	1/16W
R636	NRSA63J-183X	M.G.RESISTOR	18k	1/16W
R637	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R638	NRSA63J-823X	M.G.RESISTOR	82k	1/16W
R645	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R647	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R651	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R652	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R653	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R654	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R655	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R656	NRSA63J-562X	M.G.RESISTOR	5.6k	1/16W
R657	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R658	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R659	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R660	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R661	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R662	NRSA63J-273X	M.G.RESISTOR	27k	1/16W
R663	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R664	NRSA63J-391X	M.G.RESISTOR	390	1/16W
R665	NRSA63J-154X	M.G.RESISTOR	150k	1/16W
R666	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R667	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R668	NRSA63J-271X	M.G.RESISTOR	270	1/16W
R669	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R670	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R671	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R672	NRSA63J-273X	M.G.RESISTOR	27k	1/16W
R673	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R674	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R675	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R676	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R678	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R679	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R680	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R681	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R682	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R683	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R684	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R685	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R686	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R687	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R688	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R690	NRSA63J-564X	M.G.RESISTOR	560k	1/16W
R691	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R692	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R693	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R694	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R695	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R696	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R697	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R698	NRSA63J-122X	M.G.RESISTOR	1.2k	1/16W
R699	NRSA63J-750X	M.G.RESISTOR	75	1/16W

Symbol No.	Part No.	Part Name	Description	
R701	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R702	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R703	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R704	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R705	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R706	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R709	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R710	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R716	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R717	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R718	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R719	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R721	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R722	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R723	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R724	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R725	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R726	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R727	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R728	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R729	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R730	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R731	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R732	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R733	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R734	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R736	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R738	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R739	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R801	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R802	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R803	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R804	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R805	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R806	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R808	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R809	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R810	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R811	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R812	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R813	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R815	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R816	NRSA63J-270X	M.G.RESISTOR	27	1/16W
R817	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R818	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R819	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R823	NRSA63J-394X	M.G.RESISTOR	390k	1/16W
R824	NRSA63J-332X	M.G.RESISTOR	3.3k	1/16W
R825	NRSA63J-272X	M.G.RESISTOR	2.7k	1/16W
R826	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R831	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R832	NRSA63J-512X	M.G.RESISTOR	5.1k	1/16W
R833	NRVA63D-560X	C.M.F.RESISTOR	56	1/16W
R834	NRVA63D-560X	C.M.F.RESISTOR	56	1/16W
R835	NRVA63D-560X	C.M.F.RESISTOR	56	1/16W
R836	NRVA63D-560X	C.M.F.RESISTOR	56	1/16W
R837	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R838	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
RA101	NRZ0015-102X	RESISTOR ARRAY	1k	
RA102	NRZ0015-102X	RESISTOR ARRAY	1k	
RA103	NRZ0012-104X	RESISTOR ARRAY	100k	
RA104	NRZ0012-104X	RESISTOR ARRAY	100k	
RA105	NRZ0015-102X	RESISTOR ARRAY	1k	
RA106	NRZ0015-102X	RESISTOR ARRAY	1k	
RA107	NRZ0012-104X	RESISTOR ARRAY	100k	
RA108	NRZ0012-104X	RESISTOR ARRAY	100k	
RA401	NRZ0015-102X	RESISTOR ARRAY	1k	
RA402	NRZ0015-102X	RESISTOR ARRAY	1k	
RA403	NRZ0015-473X	RESISTOR ARRAY	47k	

Symbol No.	Part No.	Part Name	Description	
C101	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C102	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C103	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C104	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C105	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C106	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C108	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C109	NBE51CM-226X	TAN.CAPACITOR	22	16V
C110	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C112	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C113	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C114	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C115	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C116	NBE51CM-226X	TAN.CAPACITOR	22	16V
C117	NCF21CZ-105X	CER.CAPACITOR	1	16V
C118	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C119	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C120	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C125	NBE41AM-226X	TAN.CAPACITOR	22	10V
C126	NBE51CM-226X	TAN.CAPACITOR	22	16V
C127	NBE40JM-226X	TAN.CAPACITOR	22	6.3V
C128	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C130	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C135	NBE41AM-226X	TAN.CAPACITOR	22	10V
C136	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C141	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C145	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C146	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C147	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C148	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C149	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C150	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C201	NBE41AM-226X	TAN.CAPACITOR	22	10V
C202	NBE41AM-226X	TAN.CAPACITOR	22	10V
C203	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C204	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C205	NBE41AM-475X	TAN.CAPACITOR	4.7	10V
C206	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C207	NCF21CZ-105X	CER.CAPACITOR	1	16V
C208	NCF21CZ-105X	CER.CAPACITOR	1	16V
C209	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C210	NCB31HK-222X	CER.CAPACITOR	2200p	50V
C211	NCB31HK-222X	CER.CAPACITOR	2200p	50V
C212	NBE41AM-475X	TAN.CAPACITOR	4.7	10V
C213	NBE41AM-475X	TAN.CAPACITOR	4.7	10V
C214	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C215	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C216	NBE41CM-226X	TAN.CAPACITOR	22	16V
C217	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C218	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C219	NBE41AM-226X	TAN.CAPACITOR	22	10V
C220	NBE41CM-106X	TAN.CAPACITOR	10	16V
C221	NBE41AM-106X	TAN.CAPACITOR	10	10V
C222	NBE41CM-106X	TAN.CAPACITOR	10	16V
C223	NBE41AM-106X	TAN.CAPACITOR	10	10V
C224	NDC31HJ-221X	CER.CAPACITOR	220p	50V
C225	NCB31HK-152X	CER.CAPACITOR	1500p	50V
C226	NDC31HJ-221X	CER.CAPACITOR	220p	50V
C227	NCB31HK-472X	CER.CAPACITOR	4700p	50V
C228	NCB31HK-472X	CER.CAPACITOR	4700p	50V
C231	NCB31HK-152X	CER.CAPACITOR	1500p	50V
C303	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C304	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C305	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C306	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C307	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C308	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C309	NBE51AM-226X	TAN.CAPACITOR	22	10V
C310	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C311	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C312	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C313	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C314	NBE51AM-226X	TAN.CAPACITOR	22	10V

Symbol No.	Part No.	Part Name	Description	
C316	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C317	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C318	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C319	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C320	NBE51AM-226X	TAN.CAPACITOR	22	10V
C321	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C323	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C324	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C325	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C326	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C327	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C328	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C329	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C330	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C331	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C332	NBE51AM-226X	TAN.CAPACITOR	22	10V
C333	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C334	NBE71CM-476X	TAN.CAPACITOR	47	16V
C335	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C336	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C337	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C338	NBE51CM-226X	TAN.CAPACITOR	22	16V
C339	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C340	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C342	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C343	NBE51AM-226X	TAN.CAPACITOR	22	10V
C344	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C345	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C346	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C347	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C348	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C349	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C350	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C351	NBE51AM-226X	TAN.CAPACITOR	22	10V
C352	NBE51CM-226X	TAN.CAPACITOR	22	16V
C353	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C354	NCB31CK-823X	CER.CAPACITOR	0.082	16V
C359	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C361	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C362	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C363	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C364	NDC31HJ-150X	CER.CAPACITOR	15p	50V
C366	NDC31HJ-4R0X	CER.CAPACITOR	4p	50V
C367	NBE41VM-474X	TAN.CAPACITOR	0.47	35V
C368	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C369	NBE51AM-226X	TAN.CAPACITOR	22	10V
C401	NBE51AM-476X	TAN.CAPACITOR	47	10V
C402	NBE51AM-476X	TAN.CAPACITOR	47	10V
C403	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C404	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C405	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C406	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C407	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C408	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C409	NDC31HJ-120X	CER.CAPACITOR	12p	50V
C410	NDC31HJ-120X	CER.CAPACITOR	12p	50V
C411	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C412	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C413	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C414	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C415	NBE41AM-226X	TAN.CAPACITOR	22	10V
C416	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C417	NCF21CZ-105X	CER.CAPACITOR	1	16V
C418	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C419	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C501	NDC31HJ-220X	CER.CAPACITOR	22p	50V
C502	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C503	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C505	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C506	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C507	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C508	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C509	NCB31HK-103X	CER.CAPACITOR	0.01	50V

[DV MAIN]

Symbol No.	Part No.	Part Name	Description	
C510	NCB31HK-681X	CER.CAPACITOR	680p	50V
C511	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C512	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C513	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C514	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C515	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C516	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C517	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C518	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C519	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C520	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C521	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C522	NBE41AM-226X	TAN.CAPACITOR	22	10V
C523	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C524	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C525	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C526	NCB31CK-273X	CER.CAPACITOR	0.027	16V
C527	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C528	NCB21AK-105X	CER.CAPACITOR	1	10V
C529	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C531	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C532	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C533	NBE41AM-226X	TAN.CAPACITOR	22	10V
C534	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C537	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C538	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C539	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C540	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C541	NDC31HJ-151X	CER.CAPACITOR	150p	50V
C542	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C543	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C544	NCB31HK-152X	CER.CAPACITOR	1500p	50V
C545	NCF21CZ-225X	CER.CAPACITOR	2.2	16V
C546	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C547	NBE41AM-226X	TAN.CAPACITOR	22	10V
C555	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C579	NBE51CM-226X	TAN.CAPACITOR	22	16V
C580	NBE41AM-226X	TAN.CAPACITOR	22	10V
C581	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C582	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C583	NBE71CM-476X	TAN.CAPACITOR	47	16V
C584	NBE71CM-476X	TAN.CAPACITOR	47	16V
C590	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C591	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C592	NCB31CK-273X	CER.CAPACITOR	0.027	16V
C593	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C601	NCF21CZ-105X	CER.CAPACITOR	1	16V
C602	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C603	NCF21CZ-105X	CER.CAPACITOR	1	16V
C604	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C605	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C606	NDC31HJ-220X	CER.CAPACITOR	22p	50V
C607	NDC31HJ-150X	CER.CAPACITOR	15p	50V
C608	NCF21CZ-105X	CER.CAPACITOR	1	16V
C609	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C610	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C611	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C612	NCB31HK-561X	CER.CAPACITOR	560p	50V
C613	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C614	NDC31HJ-5R0X	CER.CAPACITOR	5p	50V
C615	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C617	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C619	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C620	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C621	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C622	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C623	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C624	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C625	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C626	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C627	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C628	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C629	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C630	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C631	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C632	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C633	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C634	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C635	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C638	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C639	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C640	NBE51AM-226X	TAN.CAPACITOR	22	10V
C641	NBE51AM-226X	TAN.CAPACITOR	22	10V
C642	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C643	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C644	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C645	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C646	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C647	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C649	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C650	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C651	NBE51AM-226X	TAN.CAPACITOR	22	10V
C652	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C653	NBE51AM-226X	TAN.CAPACITOR	22	10V
C654	NBE51AM-226X	TAN.CAPACITOR	22	10V
C655	NBE51AM-226X	TAN.CAPACITOR	22	10V
C656	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C657	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C658	NCB21CK-474X	CER.CAPACITOR	0.47	16V
C659	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C660	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C661	NCB21CK-224X	CER.CAPACITOR	0.22	16V
C662	NBE41AM-106X	TAN.CAPACITOR	10	10V
C663	NBE21CM-684X	TAN.CAPACITOR	0.68	16V
C664	NCB31HK-681X	CER.CAPACITOR	680p	50V
C665	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C666	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C667	NCB31CK-273X	CER.CAPACITOR	0.027	16V
C668	NCF21CZ-105X	CER.CAPACITOR	1	16V
C669	NBE61CM-107X	TAN.CAPACITOR	100	16V
C672	NCB31HK-152X	CER.CAPACITOR	1500p	50V
C673	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C674	NCB31HK-102X	CER.CAPACITOR	1000p	50V
C675	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C676	NBE61CM-107X	TAN.CAPACITOR	100	16V
C677	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C678	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C679	NBE41AM-106X	TAN.CAPACITOR	10	10V
C680	NBE41CM-335X	TAN.CAPACITOR	3.3	16V
C681	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C682	NBE61CM-107X	TAN.CAPACITOR	100	16V
C683	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C684	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C685	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C687	NCF21CZ-105X	CER.CAPACITOR	1	16V
C688	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C689	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C690	NCF21CZ-105X	CER.CAPACITOR	1	16V
C691	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C692	NCF21CZ-105X	CER.CAPACITOR	1	16V
C693	NCF21CZ-105X	CER.CAPACITOR	1	16V
C694	NBE21CM-225X	TAN.CAPACITOR	2.2	16V
C695	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C696	NDC31HJ-150X	CER.CAPACITOR	15p	50V
C697	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C698	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C699	NDC31HJ-150X	CER.CAPACITOR	15p	50V
C700	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C706	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C709	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C710	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C711	NBE51AM-226X	TAN.CAPACITOR	22	10V
C712	NBE51AM-226X	TAN.CAPACITOR	22	10V
C713	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C714	NCB31CK-104X	CER.CAPACITOR	0.1	16V

Symbol No.	Part No.	Part Name	Description	
C717	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C718	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C719	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C720	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C721	NDC31HJ-180X	CER.CAPACITOR	18p	50V
C722	NDC31HJ-180X	CER.CAPACITOR	18p	50V
C738	NCB41CM-106X	CER.CAPACITOR	10	16V
C739	NCB41CM-106X	CER.CAPACITOR	10	16V
C801	NBE41AM-226X	TAN.CAPACITOR	22	10V
C802	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C803	NBE40JM-226X	TAN.CAPACITOR	22	6.3V
C804	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C805	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C806	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C807	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C808	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C809	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C810	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C811	NCB31HK-102X	CER.CAPACITOR	1000p	50V
C812	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C813	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C814	NBE41AM-226X	TAN.CAPACITOR	22	10V
C815	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C816	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C817	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C819	NCF31CZ-104X	CER.CAPACITOR	0.1	16V
C820	NDC31HJ-271X	CER.CAPACITOR	270p	50V
C821	NDC31HJ-5R0X	CER.CAPACITOR	5p	50V
C822	NDC31HJ-6R0X	CER.CAPACITOR	6p	50V
L111	NQL23CM-330X	COIL	33uH	
L112	NQL23CM-330X	COIL	33uH	
L113	NQL044K-470X	COIL	47uH	
L114	NQL23CM-330X	COIL	33uH	
L115	NQL23CM-330X	COIL	33uH	
L201	NQL114K-100X	COIL	10uH	
L202	NQL114K-100X	COIL	10uH	
L301	NQL044K-100X	COIL	10uH	
L302	NQL044K-100X	COIL	10uH	
L303	NQL044K-100X	COIL	10uH	
L304	NQL024J-1R2X	COIL	1.2uH	
L305	NQL044K-100X	COIL	10uH	
L306	NQL044K-100X	COIL	10uH	
L307	NQL044K-100X	COIL	10uH	
L309	NQL044K-100X	COIL	10uH	
L310	NQL044K-100X	COIL	10uH	
L311	NQL044K-100X	COIL	10uH	
L312	NQL044K-100X	COIL	10uH	
L313	NQL044K-100X	COIL	10uH	
L401	NQL044K-100X	COIL	10uH	
L501	NQL044K-100X	COIL	10uH	
L502	NQL044K-100X	COIL	10uH	
L511	NQL114K-470X	COIL	47uH	
L513	NQL044K-100X	COIL	10uH	
L601	NQL044K-100X	COIL	10uH	
L602	NQL024J-150X	COIL	15uH	
L603	NQL044K-100X	COIL	10uH	
L604	NQL044K-100X	COIL	10uH	
L605	NQL044K-100X	COIL	10uH	
L606	NQL024J-5R6X	COIL	5.6uH	
L608	NQL044K-100X	COIL	10uH	
L609	NQL044K-100X	COIL	10uH	
L610	NQL044K-221X	COIL	220uH	
L612	NQL044K-221X	COIL	220uH	
L613	NQL044K-100X	COIL	10uH	
L614	NQL044K-220X	COIL	22uH	
L615	NQL044K-220X	COIL	22uH	
L801	NQL044K-100X	COIL	10uH	
L802	NQL044K-100X	COIL	10uH	
L803	NQL044K-100X	COIL	10uH	
L804	NQR0276-001X	COIL		

Symbol No.	Part No.	Part Name	Description
LC101	PGZ01972Z	LC FILTER	
LC102	PGZ01972Z	LC FILTER	
LC103	PGZ01972Z	LC FILTER	
LC104	PGZ01972Z	LC FILTER	
LC105	PGZ01972Z	LC FILTER	
LC301	PGZ01972Z	LC FILTER	
LC302	PGZ01972Z	LC FILTER	
LC303	PGZ01972Z	LC FILTER	
LC501	PGZ01972Z	LC FILTER	
LC502	PGZ01972Z	LC FILTER	
X101	NAX0349-001X	CRYSTAL	27MHz
X401	NAX0348-001X	CRYSTAL	27MHz
X601	NAX0227-001X	CRYSTAL	503kHz
X602	NAX0348-001X	CRYSTAL	27MHz
X603	NAX0280-001X	CRYSTAL	26.995MHz
X801	NAX0241-001X	CRYSTAL	24.576MHz
CN1	QGB0805L2-60X	CONNECTOR	60PIN
CN2	QGB0805L2-60X	CONNECTOR	60PIN
CN102	QGA1201C2-13X	CONNECTOR	13PIN
CN104	QGB0801L1-26X	CONNECTOR	26PIN
CN106	QGA1201F2-08X	CONNECTOR	8PIN
CN108	QGF0508F1-10X	CONNECTOR	10PIN
CN401	QGF0508F1-18X	CONNECTOR	18PIN
CN402	QGF0508F1-20X	CONNECTOR	20PIN
CN403	QGB0801L1-26X	CONNECTOR	26PIN
CN501	QGF0508F1-20X	CONNECTOR	20PIN
CN801	QGA1201F2-06X	CONNECTOR	6PIN
K101	PGZ00627Z	FERRATE BEADS	
K102	PGZ00627Z	FERRATE BEADS	
K301	NQR0269-004X	FERRITE BEADS	
K303	NQR0129-003X	FERRITE BEADS	
K401	PGZ00627Z	FERRATE BEADS	
K402	PGZ00627Z	FERRATE BEADS	
K403	PGZ00627Z	FERRATE BEADS	
K404	PGZ00627Z	FERRATE BEADS	
K601	PGZ00627Z	FERRATE BEADS	
K602	NQR0269-004X	FERRITE BEADS	
K603	NQR0269-004X	FERRITE BEADS	
K604	NQR0269-004X	FERRITE BEADS	
K605	NQR0269-004X	FERRITE BEADS	
K801	PGZ00627Z	FERRATE BEADS	
LA301	NQR0320-010X	F.B.ARRAY	
LA302	NQR0320-010X	F.B.ARRAY	
LA303	NQR0320-010X	F.B.ARRAY	
LA401	NQR0330-009X	EMI FILTER ARY	
LA402	NQR0330-009X	EMI FILTER ARY	
LA403	NQR0330-009X	EMI FILTER ARY	
LA404	NQR0330-009X	EMI FILTER ARY	
LA601	NQR0330-009X	EMI FILTER ARY	
LA602	NQR0330-009X	EMI FILTER ARY	
LA603	NQR0330-009X	EMI FILTER ARY	
LA604	NQR0330-009X	EMI FILTER ARY	
LA605	NQR0330-009X	EMI FILTER ARY	
LA606	NQR0320-010X	F.B.ARRAY	
LA607	NQR0320-010X	F.B.ARRAY	

6.6 ISB BOARD ASSEMBLY PARTS LIST 1 1

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Symbol No.	Part No.	Part Name	Description	
SK501	QNV0027-010	IC SOCKET	20PIN	
IC503	CXA1439M-X	I.C.(M)	SONY	
IC504	AD8031ART-X	I.C.(M)	ANALOG DEVICES	
IC505	TC74VHC04FT-X	I.C.(M)	TOSHIBA	
IC506	LP2986IMM-X	I.C.(M)	NATIONAL SEMOCO	
Q501	2SC3930/BC/-X	TRANSISTOR	MATSUSHITA	
R501	NRSA63D-105X	M.G.RESISTOR	1M	1/16W
R502	NRSA63D-391X	M.G.RESISTOR	390	1/16W
R503	NRSA63D-184X	M.G.RESISTOR	180k	1/16W
R504	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
R505	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R506	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R507	NRSA63D-112X	M.G.RESISTOR	1.1k	1/16W
R508	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R509	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R510	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R511	NRSA63D-180X	M.G.RESISTOR	18	1/16W
R512	NRSA63D-180X	M.G.RESISTOR	18	1/16W
R513	NRSA63D-180X	M.G.RESISTOR	18	1/16W
R514	NRSA63D-180X	M.G.RESISTOR	18	1/16W
R519	NRSA63D-334X	M.G.RESISTOR	330k	1/16W
R520	NRSA63D-154X	M.G.RESISTOR	150k	1/16W
R521	NRSA63J-225X	M.G.RESISTOR	2.2M	1/16W
R522	NRSA63D-563X	M.G.RESISTOR	56k	1/16W
R523	NRSA63J-564X	M.G.RESISTOR	560k	1/16W
C501	NCB31EK-473X	CER.CAPACITOR	0.047	25V
C504	NBE40GM-476X	TAN.CAPACITOR	47	4V
C505	NCB31EK-473X	CER.CAPACITOR	0.047	25V
C506	NBE21AM-225X	TAN.CAPACITOR	2.2	10V
C507	NBE41VM-335X	TAN.CAPACITOR	3.3	35V
C508	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C509	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C510	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C511	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C512	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C513	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C514	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C515	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C518	NCB11CK-105X	CER.CAPACITOR	1	16V
C519	NCB11CK-105X	CER.CAPACITOR	1	16V
C520	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C521	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C522	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C523	NDC31HJ-220X	CER.CAPACITOR	22p	50V
C524	NBE21AM-106X	TAN.CAPACITOR	10	10V
C525	NBE21AM-106X	TAN.CAPACITOR	10	10V
LC501	SCV1804-222Z	LC FILTER		
CN11	QGF0508F2-20X	CONNECTOR	20PIN	

6.7 ISG BOARD ASSEMBLY PARTS LIST 1 2

SCK2604-03-00B 1 2 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
SK501	QNV0027-010	IC SOCKET	20PIN	
IC503	CXA1439M-X	I.C.(M)	SONY	
IC504	AD8031ART-X	I.C.(M)	ANALOG DEVICES	
IC505	TC74VHC04FT-X	I.C.(M)	TOSHIBA	
IC506	LP2986IMM-X	I.C.(M)	NATIONAL SEMICO	
Q501	2SC3930/BC/-X	TRANSISTOR	MATSUSHITA	
R501	NRSA63D-105X	M.G.RESISTOR	1M	1/16W
R502	NRSA63D-391X	M.G.RESISTOR	390	1/16W
R503	NRSA63D-184X	M.G.RESISTOR	180k	1/16W
R504	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
R505	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R506	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R507	NRSA63D-112X	M.G.RESISTOR	1.1k	1/16W
R508	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R509	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R510	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R511	NRSA63D-180X	M.G.RESISTOR	18	1/16W
R512	NRSA63D-180X	M.G.RESISTOR	18	1/16W
R513	NRSA63D-180X	M.G.RESISTOR	18	1/16W
R514	NRSA63D-180X	M.G.RESISTOR	18	1/16W
R519	NRSA63D-334X	M.G.RESISTOR	330k	1/16W
R520	NRSA63D-154X	M.G.RESISTOR	150k	1/16W
R521	NRSA63J-225X	M.G.RESISTOR	2.2M	1/16W
R522	NRSA63D-563X	M.G.RESISTOR	56k	1/16W
R523	NRSA63J-564X	M.G.RESISTOR	560k	1/16W
C501	NCB31EK-473X	CER.CAPACITOR	0.047	25V
C504	NBE40GM-476X	TAN.CAPACITOR	47	4V
C505	NCB31EK-473X	CER.CAPACITOR	0.047	25V
C506	NBE21AM-225X	TAN.CAPACITOR	2.2	10V
C507	NBE41VM-335X	TAN.CAPACITOR	3.3	35V
C508	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C509	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C510	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C511	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C512	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C513	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C514	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C515	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C518	NCB11CK-105X	CER.CAPACITOR	1	16V
C519	NCB11CK-105X	CER.CAPACITOR	1	16V
C520	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C521	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C522	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C523	NDC31HJ-220X	CER.CAPACITOR	22p	50V
C524	NBE21AM-106X	TAN.CAPACITOR	10	10V
C525	NBE21AM-106X	TAN.CAPACITOR	10	10V
LC501	SCV1804-222Z	LC FILTER		
CN12	QGF0508F1-20X	CONNECTOR	20PIN	

6.8 ISR BOARD ASSEMBLY PARTS LIST 1 3

SCK2604-04-00B 1 3 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
SK501	QNV0027-010	IC SOCKET	20PIN
IC503	CXA1439M-X	I.C.(M)	SONY
IC504	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC505	TC74VHC04FT-X	I.C.(M)	TOSHIBA
IC506	LP2986IMM-X	I.C.(M)	NATIONAL SEMICO
Q501	2SC3930/BC/-X	TRANSISTOR	MATSUSHITA
R501	NRSA63D-105X	M.G.RESISTOR	1M 1/16W
R502	NRSA63D-391X	M.G.RESISTOR	390 1/16W
R503	NRSA63D-184X	M.G.RESISTOR	180k 1/16W
R504	NRSA63D-273X	M.G.RESISTOR	27k 1/16W
R505	NRSA63D-682X	M.G.RESISTOR	6.8k 1/16W
R506	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R507	NRSA63D-112X	M.G.RESISTOR	1.1k 1/16W
R508	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R509	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R510	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R511	NRSA63D-180X	M.G.RESISTOR	18 1/16W
R512	NRSA63D-180X	M.G.RESISTOR	18 1/16W
R513	NRSA63D-180X	M.G.RESISTOR	18 1/16W
R514	NRSA63D-180X	M.G.RESISTOR	18 1/16W
R519	NRSA63D-334X	M.G.RESISTOR	330k 1/16W
R520	NRSA63D-154X	M.G.RESISTOR	150k 1/16W
R521	NRSA63J-225X	M.G.RESISTOR	2.2M 1/16W
R522	NRSA63D-563X	M.G.RESISTOR	56k 1/16W
R523	NRSA63J-564X	M.G.RESISTOR	560k 1/16W
C501	NCB31EK-473X	CER.CAPACITOR	0.047 25V
C504	NBE40GM-476X	TAN.CAPACITOR	47 4V
C505	NCB31EK-473X	CER.CAPACITOR	0.047 25V
C506	NBE21AM-225X	TAN.CAPACITOR	2.2 10V
C507	NBE41VM-335X	TAN.CAPACITOR	3.3 35V
C508	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C509	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C510	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C511	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C512	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C513	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C514	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C515	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C518	NCB11CK-105X	CER.CAPACITOR	1 16V
C519	NCB11CK-105X	CER.CAPACITOR	1 16V
C520	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C521	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C522	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C523	NDC31HJ-220X	CER.CAPACITOR	22p 50V
C524	NBE21AM-106X	TAN.CAPACITOR	10 10V
C525	NBE21AM-106X	TAN.CAPACITOR	10 10V
LC501	SCV1804-222Z	LC FILTER	
CN13	QGF0508F1-20X	CONNECTOR	20PIN

6.9 TG BOARD ASSEMBLY PARTS LIST 1 4

SCK2604-01-N0B(U)

SCK2604-01-P0B(E) 1 4 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	CXD1265R	I.C.(M)	SONY
IC2	MN3112SA-X	I.C.(M)	MATSUSHITA
IC3	MN3112SA-X	I.C.(M)	MATSUSHITA
IC4	MN3112SA-X	I.C.(M)	MATSUSHITA
IC5	NJM78L15UA-X	I.C.(M)	JRC
IC6	TC74VHC08FT-X	I.C.(M)	TOSHIBA
IC7	TC74VHC08FT-X	I.C.(M)	TOSHIBA
IC8	TC7SH04FU-X	I.C.(M)	TOSHIBA
IC9	TC74VHC74FT-X	I.C.(M)	TOSHIBA
IC10	TC7SH00FU-X	I.C.(M)	TOSHIBA
IC11	TC7SH04FU-X	I.C.(M)	TOSHIBA
IC14	BU4094BCFV-X	I.C.(M)	ROHM
IC15	TC74VHC74FT-X	I.C.(M)	TOSHIBA
Q1	2SB1219/QR/-X	TRANSISTOR	MATSUSHITA
D1	MA142A-X	DIODE	MATSUSHITA
D2	MA142A-X	DIODE	MATSUSHITA
D3	MA142A-X	DIODE	MATSUSHITA
D4	MA142A-X	DIODE	MATSUSHITA
R1	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R2	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R3	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R4	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R5	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R6	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R7	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R8	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R10	NRSA63D-472X	M.G.RESISTOR	4.7k 1/16W
R11	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R12	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R13	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R14	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R16	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R17	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R18	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
C1	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C2	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C3	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C4	NCB11CK-105X	CER.CAPACITOR	1 16V
C5	NCB11CK-105X	CER.CAPACITOR	1 16V
C6	NCB11CK-105X	CER.CAPACITOR	1 16V
C10	NBE41VM-105X	TAN.CAPACITOR	1 35V
C11	NBE41VM-105X	TAN.CAPACITOR	1 35V
C12	NBE41VM-105X	TAN.CAPACITOR	1 35V
C13	NBSH1AM-227X	TAN.CAPACITOR	220 10V
C18	NBSH1AM-227X	TAN.CAPACITOR	220 10V
C20	NBE41CM-106X	TAN.CAPACITOR	10 16V
C21	NBE21CM-105X	TAN.CAPACITOR	1 16V
C22	NBE41VM-335X	TAN.CAPACITOR	3.3 35V
C23	NBE51EM-106X	TAN.CAPACITOR	10 25V
C24	NBE21CM-105X	TAN.CAPACITOR	1 16V
C25	NBE41VM-335X	TAN.CAPACITOR	3.3 35V
C26	NBE51EM-106X	TAN.CAPACITOR	10 25V
C27	NBE21CM-105X	TAN.CAPACITOR	1 16V
C28	NBE41VM-335X	TAN.CAPACITOR	3.3 35V
C29	NBE51EM-106X	TAN.CAPACITOR	10 25V
C30	NBE41VM-335X	TAN.CAPACITOR	3.3 35V
C31	NBE41VM-335X	TAN.CAPACITOR	3.3 35V
C32	NBE51VM-475X	TAN.CAPACITOR	4.7 35V
C33	NBE51CM-336X	TAN.CAPACITOR	33 16V
C34	NBE71CM-476X	TAN.CAPACITOR	47 16V
C35	NCB31EK-473X	CER.CAPACITOR	0.047 25V
C36	NCB21HK-473X	CER.CAPACITOR	0.047 50V
C37	NCB31EK-473X	CER.CAPACITOR	0.047 25V
C38	NCB31EK-473X	CER.CAPACITOR	0.047 25V
C39	NCB31EK-473X	CER.CAPACITOR	0.047 25V
C40	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C41	NCB31CK-473X	CER.CAPACITOR	0.047 16V

[TG]

Symbol No.	Part No.	Part Name	Description
C42	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C43	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C44	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C45	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C46	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C47	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C48	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C49	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C50	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C51	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C52	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C53	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C54	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C55	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C56	NCB31CK-473X	CER.CAPACITOR	0.047 16V
LC1	SCV1804-222Z	LC FILTER	
LC2	SCV1804-222Z	LC FILTER	
CN11	QGF0508C1-20W	CONNECTOR	20PIN
CN12	QGF0508C1-20W	CONNECTOR	20PIN
CN13	QGF0508C1-20W	CONNECTOR	20PIN
CN14	QGF0508F1-24X	CONNECTOR	24PIN
K1	SCV2732-1LL680	FERRITE BEADS	
K2	SCV2732-1LL680	FERRITE BEADS	
K3	NRSA63D-100X	M.G.RESISTOR	10 1/16W
K4	NRSA63D-100X	M.G.RESISTOR	10 1/16W
K5	SCV2732-1HS121	FERRITE BEADS	
K6	SCV2732-1HS121	FERRITE BEADS	
K7	SCV2732-1HS121	FERRITE BEADS	
K8	SCV2732-1HS601	FERRITE BEADS	

6.10 CAM1 BOARD ASSEMBLY PARTS LIST 1 5

SCK2605-01-N1B(U)
SCK2605-01-P1B(E)

1 5 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC61	TLC2932IPW-X	I.C.(M)	TEXAS
IC62	TC74HC40103AF-X	I.C.(M)	TOSHIBA
IC63	TC74HC40103AF-X	I.C.(M)	TOSHIBA
IC64	TC7W74FU-X	I.C.(M)	TOSHIBA
IC65	TC7SH04FU-X	I.C.(M)	TOSHIBA
IC66	TC7SH04FU-X	I.C.(M)	TOSHIBA
IC412	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC413	AD603AR-X	I.C.(M)	ANALOG DEVICES
IC415	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC421	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC422	TC7W66FU-X	I.C.(M)	TOSHIBA
IC424	NJM062V-X	I.C.(M)	JRC
IC425	TC7S66FU-X	I.C.(M)	TOSHIBA
IC429	NJM062V-X	I.C.(M)	JRC
IC511	TC74HC4053AFT-X	I.C.(M)	TOSHIBA
IC512	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC513	AD603AR-X	I.C.(M)	ANALOG DEVICES
IC514	TC74HC4053AFT-X	I.C.(M)	TOSHIBA
IC515	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC516	TC74HC4053AFT-X	I.C.(M)	TOSHIBA
IC521	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC522	TC7W66FU-X	I.C.(M)	TOSHIBA
IC524	NJM062V-X	I.C.(M)	JRC
IC525	TC7S66FU-X	I.C.(M)	TOSHIBA
IC526	MB88345PF	I.C.(M)	FUJITSU
IC527	TC7W74FU-X	I.C.(M)	TOSHIBA
IC528	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC529	NJM062V-X	I.C.(M)	JRC
IC531	TC7SH08FU-X	I.C.(M)	TOSHIBA
IC532	LP2986IMM-X	I.C.(M)	NATIONAL SEMICO
IC612	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC613	AD603AR-X	I.C.(M)	ANALOG DEVICES
IC615	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC621	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC622	TC7W66FU-X	I.C.(M)	TOSHIBA
IC624	NJM062V-X	I.C.(M)	JRC
IC625	TC7S66FU-X	I.C.(M)	TOSHIBA
IC629	NJM062V-X	I.C.(M)	JRC
IC901	MB90T678BPF	I.C.(M)	FUJITSU
IC903	CY62256LL70SN-X	I.C.(M)	CYPRESS
IC904	TC74VHC373FT-X	I.C.(M)	TOSHIBA
IC905	NM93C86AEM8-X	I.C.(M)	NATIONAL SEMICO
IC906	MN12821-QR-X	I.C.(M)	MATSUSHITA
IC907	TC7SH04FU-X	I.C.(M)	TOSHIBA
IC908	TC7SH04FU-X	I.C.(M)	TOSHIBA
IC909	SN74LV125APW-X	I.C.(M)	TEXAS
IC910	LP2986IMM-X	I.C.(M)	NATIONAL SEMICO
IC911	TC7SH04FU-X	I.C.(M)	TOSHIBA
IC912	TC7SH08FU-X	I.C.(M)	TOSHIBA
Q411	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q412	2SA1790/BC/-X	TRANSISTOR	MATSUSHITA
Q511	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q512	2SA1790/BC/-X	TRANSISTOR	MATSUSHITA
Q513	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q514	DTA124EUA-X	TRANSISTOR	ROHM
Q515	2SA1790/BC/-X	TRANSISTOR	MATSUSHITA
Q516	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q517	2SA1790/BC/-X	TRANSISTOR	MATSUSHITA
Q611	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q612	2SA1790/BC/-X	TRANSISTOR	MATSUSHITA
D402	MA742-X	DIODE	MATSUSHITA
D502	MA742-X	DIODE	MATSUSHITA
D602	MA742-X	DIODE	MATSUSHITA
D901	MA143A-X	DIODE	MATSUSHITA
D902	MA143A-X	DIODE	MATSUSHITA
R61	NRSA63D-272X	M.G.RESISTOR	2.7k 1/16W
R62	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R63	NRSA63D-563X	M.G.RESISTOR	56k 1/16W
R64	NRSA63D-561X	M.G.RESISTOR	560 1/16W

Symbol No.	Part No.	Part Name	Description
R66	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R67	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R68	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R69	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R70	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R71	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R72	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R73	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R74	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R75	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R76	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R77	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R78	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R79	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R80	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R81	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R431	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R432	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R433	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R434	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R435	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R436	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R437	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R438	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R441	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R442	NRSA63D-182X	M.G.RESISTOR	1.8k 1/16W
R443	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R444	NRSA63D-681X	M.G.RESISTOR	680 1/16W
R445	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R446	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R447	NRSA63D-112X	M.G.RESISTOR	1.1k 1/16W
R448	NRSA63D-221X	M.G.RESISTOR	220 1/16W
R449	NRSA63D-121X	M.G.RESISTOR	120 1/16W
R450	NRSA63D-392X	M.G.RESISTOR	3.9k 1/16W
R457	NRSA63D-911X	M.G.RESISTOR	910 1/16W
R458	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R461	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R462	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R463	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R464	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R465	NRSA63D-113X	M.G.RESISTOR	11k 1/16W
R466	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R467	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R468	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R469	NRSA63D-123X	M.G.RESISTOR	12k 1/16W
R470	NRSA63D-123X	M.G.RESISTOR	12k 1/16W
R471	NRSA63D-113X	M.G.RESISTOR	11k 1/16W
R484	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R485	NRSA63D-363X	M.G.RESISTOR	36k 1/16W
R486	NRSA63D-184X	M.G.RESISTOR	180k 1/16W (U)
	NRSA63D-224X	M.G.RESISTOR	220k 1/16W (E)
R487	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R488	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R489	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R490	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R491	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R492	NRSA63D-562X	M.G.RESISTOR	5.6k 1/16W
R493	NRSA63D-752X	M.G.RESISTOR	7.5k 1/16W
R494	NRSA63D-243X	M.G.RESISTOR	24k 1/16W
R495	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R496	NRSA63D-392X	M.G.RESISTOR	3.9k 1/16W
R497	NRSA63D-823X	M.G.RESISTOR	82k 1/16W
R498	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R499	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R531	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R532	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R533	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R534	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R535	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R536	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R537	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R538	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R541	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W

Symbol No.	Part No.	Part Name	Description
R542	NRSA63D-391X	M.G.RESISTOR	390 1/16W
R543	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R544	NRSA63D-681X	M.G.RESISTOR	680 1/16W
R545	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R546	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R547	NRSA63D-112X	M.G.RESISTOR	1.1k 1/16W
R548	NRSA63D-221X	M.G.RESISTOR	220 1/16W
R549	NRSA63D-121X	M.G.RESISTOR	120 1/16W
R550	NRSA63D-392X	M.G.RESISTOR	3.9k 1/16W
R551	NRSA63D-334X	M.G.RESISTOR	330k 1/16W
R552	NRSA63D-224X	M.G.RESISTOR	220k 1/16W
R553	NRSA63J-225X	M.G.RESISTOR	2.2M 1/16W
R554	NRSA63D-563X	M.G.RESISTOR	56k 1/16W
R555	NRSA63J-564X	M.G.RESISTOR	560k 1/16W
R557	NRSA63D-911X	M.G.RESISTOR	910 1/16W
R558	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R559	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R560	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R561	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R562	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R563	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R564	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R565	NRSA63D-113X	M.G.RESISTOR	11k 1/16W
R567	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R568	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R569	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R570	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R571	NRSA63D-113X	M.G.RESISTOR	11k 1/16W
R573	NRSA63D-222X	M.G.RESISTOR	2.2k 1/16W
R574	NRSA63D-394X	M.G.RESISTOR	390k 1/16W (U)
	NRSA63J-394X	M.G.RESISTOR	390k 1/16W (E)
R575	NRSA63D-122X	M.G.RESISTOR	1.2k 1/16W
R576	NRSA63D-224X	M.G.RESISTOR	220k 1/16W
R577	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R578	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R579	NRSA63D-363X	M.G.RESISTOR	36k 1/16W
R580	NRSA63D-682X	M.G.RESISTOR	6.8k 1/16W
R581	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R582	NRSA63D-682X	M.G.RESISTOR	6.8k 1/16W
R583	NRSA63D-823X	M.G.RESISTOR	82k 1/16W
R584	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R585	NRSA63D-363X	M.G.RESISTOR	36k 1/16W
R586	NRSA63D-184X	M.G.RESISTOR	180k 1/16W (U)
	NRSA63D-224X	M.G.RESISTOR	220k 1/16W (E)
R587	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R588	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R589	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R590	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R591	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R592	NRSA63D-562X	M.G.RESISTOR	5.6k 1/16W
R593	NRSA63D-752X	M.G.RESISTOR	7.5k 1/16W
R594	NRSA63D-393X	M.G.RESISTOR	39k 1/16W
R596	NRSA63D-752X	M.G.RESISTOR	7.5k 1/16W
R597	NRSA63D-154X	M.G.RESISTOR	150k 1/16W
R598	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R599	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R631	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R632	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R633	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R634	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R635	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R636	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R637	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R638	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R641	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R642	NRSA63D-471X	M.G.RESISTOR	470 1/16W
R643	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R644	NRSA63D-681X	M.G.RESISTOR	680 1/16W
R645	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R646	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R647	NRSA63D-112X	M.G.RESISTOR	1.1k 1/16W
R648	NRSA63D-221X	M.G.RESISTOR	220 1/16W
R649	NRSA63D-121X	M.G.RESISTOR	120 1/16W

[CAM1]

Symbol No.	Part No.	Part Name	Description
R650	NRSA63D-392X	M.G.RESISTOR	3.9k 1/16W
R657	NRSA63D-911X	M.G.RESISTOR	910 1/16W
R658	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R661	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R662	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R663	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R664	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R665	NRSA63D-113X	M.G.RESISTOR	11k 1/16W
R666	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R667	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R668	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R669	NRSA63D-123X	M.G.RESISTOR	12k 1/16W
R670	NRSA63D-123X	M.G.RESISTOR	12k 1/16W
R671	NRSA63D-113X	M.G.RESISTOR	11k 1/16W
R678	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R684	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R685	NRSA63D-363X	M.G.RESISTOR	36k 1/16W
R686	NRSA63D-184X	M.G.RESISTOR	180k 1/16W (U)
	NRSA63D-224X	M.G.RESISTOR	220k 1/16W (E)
R687	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R688	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R689	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R690	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R691	NRSA63D-821X	M.G.RESISTOR	820 1/16W
R692	NRSA63D-562X	M.G.RESISTOR	5.6k 1/16W
R693	NRSA63D-752X	M.G.RESISTOR	7.5k 1/16W
R694	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R695	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R696	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R697	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R698	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R699	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R901	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R902	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R903	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R904	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R905	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R906	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R907	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R908	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R909	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R910	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R911	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R912	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R913	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R914	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R915	NRSA63J-105X	M.G.RESISTOR	1M 1/16W
R916	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R917	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R918	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R919	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R920	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R921	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R922	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R923	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R924	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R925	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R926	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R927	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R928	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R929	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R930	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R931	NRSA63D-392X	M.G.RESISTOR	3.9k 1/16W
R932	NRSA63D-622X	M.G.RESISTOR	6.2k 1/16W
R933	NRSA63D-392X	M.G.RESISTOR	3.9k 1/16W
R934	NRSA63D-622X	M.G.RESISTOR	6.2k 1/16W
R935	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R936	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R937	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R938	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R939	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R940	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R941	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R942	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R943	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R944	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R945	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R946	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R947	NRSA63D-563X	M.G.RESISTOR	56k 1/16W
R948	NRSA63D-154X	M.G.RESISTOR	150k 1/16W
R949	NRSA63D-334X	M.G.RESISTOR	330k 1/16W
R1909	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1910	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1912	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1913	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1914	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1915	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1916	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1917	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1918	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1919	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1920	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1921	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1922	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1923	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1924	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1925	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1926	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1927	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1928	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1929	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1930	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1931	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1932	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1934	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1935	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1936	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R1938	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R1939	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R1940	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R1941	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R1942	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
R1943	NRSA63D-223X	M.G.RESISTOR	22k 1/16W
C61	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C62	NBE41CM-106X	TAN.CAPACITOR	10 16V
C63	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C64	NBE41CM-106X	TAN.CAPACITOR	10 16V
C65	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C66	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C67	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C68	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C69	NDC31HJ-270X	CER.CAPACITOR	27p 50V
C431	NDC31HJ-5R0X	CER.CAPACITOR	5p 50V
C432	NDC31HJ-100X	CER.CAPACITOR	10p 50V
C433	NDC31HJ-5R0X	CER.CAPACITOR	5p 50V
C434	NDC31HJ-330X	CER.CAPACITOR	33p 50V
C435	NDC31HJ-220X	CER.CAPACITOR	22p 50V
C436	NDC31HJ-220X	CER.CAPACITOR	22p 50V
C437	NDC31HJ-470X	CER.CAPACITOR	47p 50V
C438	NDC31HJ-470X	CER.CAPACITOR	47p 50V
C439	NDC31HJ-121X	CER.CAPACITOR	120p 50V
C451	NCB31EK-472X	CER.CAPACITOR	4700p 25V
C452	NCB21HK-472X	CER.CAPACITOR	4700p 50V
C453	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C454	NCB21AK-105X	CER.CAPACITOR	1 10V
C456	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C461	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C462	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C463	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C464	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C465	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C466	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C475	NDC31HJ-5R0X	CER.CAPACITOR	5p 50V
C531	NDC31HJ-7R0X	CER.CAPACITOR	7p 50V

Symbol No.	Part No.	Part Name	Description
C532	NDC31HJ-150X	CER.CAPACITOR	15p 50V
C533	NDC31HJ-150X	CER.CAPACITOR	15p 50V
C534	NDC31HJ-7R0X	CER.CAPACITOR	7p 50V
C535	NDC31HJ-220X	CER.CAPACITOR	22p 50V
C536	NDC31HJ-220X	CER.CAPACITOR	22p 50V
C537	NDC31HJ-470X	CER.CAPACITOR	47p 50V
C538	NDC31HJ-470X	CER.CAPACITOR	47p 50V
C539	NDC31HJ-121X	CER.CAPACITOR	120p 50V
C540	NDC31HJ-150X	CER.CAPACITOR	15p 50V
C541	NDC31HJ-270X	CER.CAPACITOR	27p 50V
C551	NCB31EK-472X	CER.CAPACITOR	4700p 25V
C552	NCB21HK-472X	CER.CAPACITOR	4700p 50V
C553	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C554	NCB21AK-105X	CER.CAPACITOR	1 10V
C556	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C557	NDC31HJ-470X	CER.CAPACITOR	47p 50V
C558	NDC31HJ-470X	CER.CAPACITOR	47p 50V
C561	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C562	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C563	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C564	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C565	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C566	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C567	NDC31HJ-220X	CER.CAPACITOR	22p 50V
C568	NBE21AM-106X	TAN.CAPACITOR	10 10V
C569	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C570	NBE21AM-106X	TAN.CAPACITOR	10 10V
C571	NBSH1AM-227X	TAN.CAPACITOR	220 10V
C572	NBSH1AM-227X	TAN.CAPACITOR	220 10V
C573	NBSG1CM-476X	TAN.CAPACITOR	47 16V
C574	NBE21AM-106X	TAN.CAPACITOR	10 10V
C575	NDC31HJ-5R0X	CER.CAPACITOR	5p 50V
C576	NBE21AM-106X	TAN.CAPACITOR	10 10V
C631	NDC31HJ-5R0X	CER.CAPACITOR	5p 50V
C632	NDC31HJ-100X	CER.CAPACITOR	10p 50V
C633	NDC31HJ-5R0X	CER.CAPACITOR	5p 50V
C634	NDC31HJ-330X	CER.CAPACITOR	33p 50V
C635	NDC31HJ-220X	CER.CAPACITOR	22p 50V
C636	NDC31HJ-220X	CER.CAPACITOR	22p 50V
C637	NDC31HJ-470X	CER.CAPACITOR	47p 50V
C638	NDC31HJ-470X	CER.CAPACITOR	47p 50V
C639	NDC31HJ-121X	CER.CAPACITOR	120p 50V
C651	NCB31EK-472X	CER.CAPACITOR	4700p 25V
C652	NCB21HK-472X	CER.CAPACITOR	4700p 50V
C653	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C654	NCB21AK-105X	CER.CAPACITOR	1 10V
C656	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C661	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C662	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C663	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C664	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C665	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C666	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C675	NDC31HJ-5R0X	CER.CAPACITOR	5p 50V
C901	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C902	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C903	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C904	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C905	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C906	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C907	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C908	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C909	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C910	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C911	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C912	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C913	NBSH1AM-227X	TAN.CAPACITOR	220 10V
C914	NBSH1AM-227X	TAN.CAPACITOR	220 10V
C915	NDC31HJ-180X	CER.CAPACITOR	18p 50V
C916	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C917	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C918	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C919	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C922	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
L401	NQL054J-3R3X	COIL	3.3uH
L402	NQL054K-100X	COIL	10uH
L403	NQL054K-100X	COIL	10uH
L404	NQL054K-330X	COIL	33uH
L405	NQL054K-100X	COIL	10uH
L406	NQL054K-100X	COIL	10uH
L407	NQL054K-1R0X	COIL	1uH
L501	NQL054K-120X	COIL	12uH
L502	NQL054K-150X	COIL	15uH
L503	NQL054K-150X	COIL	15uH
L504	NQL054K-330X	COIL	33uH
L505	NQL054K-100X	COIL	10uH
L506	NQL054K-100X	COIL	10uH
L507	NQL054K-1R0X	COIL	1uH
L508	NQL054K-120X	COIL	12uH
L509	NQL054K-4R7X	COIL	4.7uH
L601	NQL054J-3R3X	COIL	3.3uH
L602	NQL054K-100X	COIL	10uH
L603	NQL054K-100X	COIL	10uH
L604	NQL054K-330X	COIL	33uH
L605	NQL054K-100X	COIL	10uH
L606	NQL054K-100X	COIL	10uH
L607	NQL054K-1R0X	COIL	1uH
LC61	SCV1804-222Z	LC FILTER	
X901	NAX0061-001X	CRYSTAL	4MHz
CN14	QGF0508F1-24X	CONNECTOR	24PIN
CN21	QGF0508F1-50X	CONNECTOR	50PIN
CN23	QGF0508F1-30X	CONNECTOR	30PIN
CN24	QGB0805K1-40X	CONNECTOR	40PIN
CN45	QGA1201F2-15X	CONNECTOR	15PIN
CN46	QGA1201F2-03X	CONNECTOR	3PIN
CN101	QGA1201F2-04X	CONNECTOR	4PIN
K61	SCV2732-1HS601	FERRITE BEADS	
K901	SCV2732-1LL680	FERRITE BEADS	
K902	SCV2732-1LL680	FERRITE BEADS	
K903	SCV2732-1LL680	FERRITE BEADS	
K904	SCV2732-1LL680	FERRITE BEADS	
K905	SCV2732-1LL680	FERRITE BEADS	
K906	SCV2732-1LL680	FERRITE BEADS	
K907	SCV2732-1LL680	FERRITE BEADS	
K908	SCV2732-1LL680	FERRITE BEADS	
K909	SCV2732-1LL680	FERRITE BEADS	
K910	SCV2732-1LL680	FERRITE BEADS	
K911	SCV2732-1LL680	FERRITE BEADS	
K912	SCV2732-1LL680	FERRITE BEADS	
K913	SCV2732-1LL680	FERRITE BEADS	
K914	SCV2732-1LL680	FERRITE BEADS	
K915	SCV2732-1LL680	FERRITE BEADS	
K916	SCV2732-1LL680	FERRITE BEADS	
K917	SCV2732-1LL680	FERRITE BEADS	
K918	SCV2732-1LL680	FERRITE BEADS	
K919	SCV2732-1LL680	FERRITE BEADS	
K920	SCV2732-1LL680	FERRITE BEADS	
K921	SCV2732-1LL680	FERRITE BEADS	
K922	SCV2732-1LL680	FERRITE BEADS	
K923	SCV2732-1LL680	FERRITE BEADS	
K924	SCV2732-1LL680	FERRITE BEADS	
K925	SCV2732-1LL680	FERRITE BEADS	
K926	SCV2732-1LL680	FERRITE BEADS	
K927	SCV2732-1LL680	FERRITE BEADS	
K928	SCV2732-1LL680	FERRITE BEADS	
K929	SCV2732-1LL680	FERRITE BEADS	

6.11 CAM2 BOARD ASSEMBLY PARTS LIST 1 6

SCK2605-02-N0B(U)

SCK2605-02-P0B(E) 1 6 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC101	LM1881M-X	I.C.(M)	NATIONAL SEMICO
IC102	XC95144X10T-002	I.C.(M)	XILINX
IC103	TC74VHCT541AFTX	I.C.(M)	TOSHIBA
IC104	TC74VHC574FT-X	I.C.(M)	TOSHIBA
IC105	M62353GP-X	I.C.(M)	MITSUBISHI
IC106	TC7SU04FU-X	I.C.(M)	TOSHIBA
IC107	TC7SU04FU-X	I.C.(M)	TOSHIBA
IC108	UPC812G2-X	I.C.(M)	NEC
IC109	TC74HC4538AFS-X	I.C.(M)	TOSHIBA
IC112	TC7SH00FU-X	I.C.(M)	TOSHIBA
IC113	TC4W53FU-X	I.C.(M)	TOSHIBA
IC114	TC7WT241FU-X	I.C.(M)	TOSHIBA
IC115	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC116	NJM062V-X	I.C.(M)	JRC
IC117	TC7SH08FU-X	I.C.(M)	TOSHIBA
IC118	TC7SH00FU-X	I.C.(M)	TOSHIBA
IC119	TC7WT241FU-X	I.C.(M)	TOSHIBA
IC417	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC423	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC481	ADS933Y-X	I.C.(M)	BURR BROWN
IC517	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC581	ADS933Y-X	I.C.(M)	BURR BROWN
IC617	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC623	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC681	ADS933Y-X	I.C.(M)	BURR BROWN
IC691	REF1004C-2.5-X	I.C.(M)	
IC692	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC693	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC701	NJM2068M-D-X	I.C.(M)	JRC
IC702	TC7SH00FU-X	I.C.(M)	TOSHIBA
IC750	BU4094BCFV-X	I.C.(M)	ROHM
IC801	JCS0050	I.C.(M)	JVC
IC811	ADV7171KS	I.C.(M)	ANALOG DEVICES
IC821	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC823	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC824	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC825	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC826	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC827	CLC450AJM5-X	I.C.(M)	NATIONAL SEMICO
IC828	TC74VHC574FT-X	I.C.(M)	TOSHIBA
IC829	TC74VHC574FT-X	I.C.(M)	TOSHIBA
IC830	SN74LV125APW-X	I.C.(M)	TEXAS
IC832	LP2986IMM-X	I.C.(M)	NATIONAL SEMICO
IC833	TC7SH08FU-X	I.C.(M)	TOSHIBA
IC900	TC7SH00FU-X	I.C.(M)	TOSHIBA
IC901	TC74VHC157FT-X	I.C.(M)	TOSHIBA
IC902	UPD6461GS-913	I.C.(M)	NEC
IC907	SN74LV08APW-X	I.C.(M)	TEXAS
IC908	TC7SH32FU-X	I.C.(M)	TOSHIBA
IC909	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC910	TC4W53FU-X	I.C.(M)	TOSHIBA
IC911	TC7SH00FU-X	I.C.(M)	TOSHIBA
IC912	AD8031ART-X	I.C.(M)	ANALOG DEVICES
IC913	TC4W53FU-X	I.C.(M)	TOSHIBA
Q101	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q601	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q602	2SA1790/BC/-X	TRANSISTOR	MATSUSHITA
Q701	2SB1463/RST/-X	TRANSISTOR	MATSUSHITA
Q702	2SD2240/RST/-X	TRANSISTOR	MATSUSHITA
Q703	2SD2240/RST/-X	TRANSISTOR	MATSUSHITA
Q903	2SA1790/BC/-X	TRANSISTOR	MATSUSHITA
Q904	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q905	2SA1790/BC/-X	TRANSISTOR	MATSUSHITA
Q906	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
Q907	DTA124EUA-X	TRANSISTOR	ROHM
Q909	DTA124EUA-X	TRANSISTOR	ROHM
Q910	DTA124EUA-X	TRANSISTOR	ROHM
Q911	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA
D701	MA143A-X	DIODE	MATSUSHITA
D702	MA143A-X	DIODE	MATSUSHITA

Symbol No.	Part No.	Part Name	Description
D750	MA143A-X	DIODE	MATSUSHITA
D751	MA143A-X	DIODE	MATSUSHITA
D752	MA111-X	DIODE	MATSUSHITA
D901	HZM6C-X	ZENER DIODE	HITACHI
D903	MA143A-X	DIODE	MATSUSHITA
D904	MA143A-X	DIODE	MATSUSHITA
D905	MA143A-X	DIODE	MATSUSHITA
D906	MA143A-X	DIODE	MATSUSHITA
R102	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R103	NRSA63D-222X	M.G.RESISTOR	2.2k 1/16W
R104	NRSA63D-122X	M.G.RESISTOR	1.2k 1/16W
R105	NRSA63D-684X	M.G.RESISTOR	680k 1/16W
R106	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R114	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R115	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (U)
R116	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R117	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R118	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R119	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R120	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R122	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R126	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R129	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R130	NRSA63D-221X	M.G.RESISTOR	220 1/16W
R131	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R132	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R133	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R134	NRSA63D-224X	M.G.RESISTOR	220k 1/16W
R135	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R138	NRSA63D-823X	M.G.RESISTOR	82k 1/16W
R139	NRSA63D-563X	M.G.RESISTOR	56k 1/16W
R140	NRSA63D-222X	M.G.RESISTOR	2.2k 1/16W
R141	NRSA63D-333X	M.G.RESISTOR	33k 1/16W
R142	NRSA63D-562X	M.G.RESISTOR	5.6k 1/16W
R143	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R144	NRSA63D-224X	M.G.RESISTOR	220k 1/16W
R145	NRSA63D-104X	M.G.RESISTOR	100k 1/16W
R146	NRSA63D-122X	M.G.RESISTOR	1.2k 1/16W
R147	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R148	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R149	NRSA63D-183X	M.G.RESISTOR	18k 1/16W
R150	NRSA63D-822X	M.G.RESISTOR	8.2k 1/16W
R151	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R152	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R153	NDC31HJ-680X	CER.CAPACITOR	68 50V
R157	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R158	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R159	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R160	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R161	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R162	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R163	NRSA63D-154X	M.G.RESISTOR	150k 1/16W
R164	NRSA63D-222X	M.G.RESISTOR	2.2k 1/16W
R165	NRSA63D-103X	M.G.RESISTOR	10k 1/16W
R166	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R167	NRSA63D-331X	M.G.RESISTOR	330 1/16W
R168	NRSA63D-471X	M.G.RESISTOR	470 1/16W
R169	NRSA63D-471X	M.G.RESISTOR	470 1/16W
R170	NRSA63D-101X	M.G.RESISTOR	100 1/16W
R190	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R191	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R211	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R212	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R213	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R215	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R451	NRSA63D-563X	M.G.RESISTOR	56k 1/16W
R452	NRSA63D-222X	M.G.RESISTOR	2.2k 1/16W
R453	NRSA63D-561X	M.G.RESISTOR	560 1/16W
R454	NRSA63D-102X	M.G.RESISTOR	1k 1/16W
R455	NRSA63D-682X	M.G.RESISTOR	6.8k 1/16W
R472	NRSA63J-105X	M.G.RESISTOR	1M 1/16W
R473	NRSA63J-105X	M.G.RESISTOR	1M 1/16W

Symbol No.	Part No.	Part Name	Description	
R474	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R475	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R477	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R478	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R481	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R551	NRSA63D-563X	M.G.RESISTOR	56k	1/16W
R552	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R553	NRSA63D-561X	M.G.RESISTOR	560	1/16W
R554	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R555	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R572	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R573	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R574	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R576	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R577	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R578	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R581	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R651	NRSA63D-563X	M.G.RESISTOR	56k	1/16W
R652	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R653	NRSA63D-561X	M.G.RESISTOR	560	1/16W
R654	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R655	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R672	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R673	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R674	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R676	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R677	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R678	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R681	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R682	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R683	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R684	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R685	NRSA63D-183X	M.G.RESISTOR	18k	1/16W
R686	NRSA63D-822X	M.G.RESISTOR	8.2k	1/16W
R687	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R688	NRSA63D-332X	M.G.RESISTOR	3.3k	1/16W
R689	NRSA63D-153X	M.G.RESISTOR	15k	1/16W
R690	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R691	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R692	NRSA63D-152X	M.G.RESISTOR	1.5k	1/16W
R693	NRSA63D-182X	M.G.RESISTOR	1.8k	1/16W
R694	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R695	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R696	NRSA63D-183X	M.G.RESISTOR	18k	1/16W
R697	NRSA63D-183X	M.G.RESISTOR	18k	1/16W
R698	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R699	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R700	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R701	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R702	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R703	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R704	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R706	NRSA63D-750X	M.G.RESISTOR	75	1/16W
R707	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R708	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R709	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R711	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R712	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R713	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R714	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R716	NRSA63D-680X	M.G.RESISTOR	68	1/16W
R717	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R718	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R719	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R721	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R722	NRSA63D-274X	M.G.RESISTOR	270k	1/16W
R723	NRSA63D-274X	M.G.RESISTOR	270k	1/16W
R724	NRSA63D-473X	M.G.RESISTOR	47k	1/16W
R725	NRSA63D-473X	M.G.RESISTOR	47k	1/16W
R726	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
R727	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R728	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R729	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W

Symbol No.	Part No.	Part Name	Description	
R730	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R750	NRSA63D-224X	M.G.RESISTOR	220k	1/16W
R751	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R752	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
R753	NRSA63D-473X	M.G.RESISTOR	47k	1/16W
R754	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R755	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R801	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R802	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R803	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R804	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R805	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R806	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R807	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R809	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R810	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R811	NRSA63D-301X	M.G.RESISTOR	300	1/16W
R813	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R814	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R815	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R818	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R819	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R820	NRSA63D-151X	M.G.RESISTOR	150	1/16W
R821	NRSA63D-151X	M.G.RESISTOR	150	1/16W
R822	NRSA63D-151X	M.G.RESISTOR	150	1/16W
R823	NRSA63D-151X	M.G.RESISTOR	150	1/16W
R824	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R825	NRSA63D-100X	M.G.RESISTOR	10	1/16W (U)
R826	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R827	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R828	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R829	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R830	NRSA63D-561X	M.G.RESISTOR	560	1/16W
R831	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R832	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R833	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R839	NRSA63D-750X	M.G.RESISTOR	75	1/16W
R841	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R842	NRSA63D-183X	M.G.RESISTOR	18k	1/16W (U)
	NRSA63D-103X	M.G.RESISTOR	10k	1/16W (E)
R843	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R844	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R845	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R846	NRSA63D-183X	M.G.RESISTOR	18k	1/16W (U)
	NRSA63D-103X	M.G.RESISTOR	10k	1/16W (E)
R847	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R848	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R849	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R850	NRSA63D-183X	M.G.RESISTOR	18k	1/16W (U)
	NRSA63D-333X	M.G.RESISTOR	33k	1/16W (E)
R851	NRSA63D-752X	M.G.RESISTOR	7.5k	1/16W (U)
	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W (E)
R852	NRSA63D-103X	M.G.RESISTOR	10k	1/16W (U)
	NRSA63D-123X	M.G.RESISTOR	12k	1/16W (E)
R853	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
R854	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R855	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R856	NRSA63D-821X	M.G.RESISTOR	820	1/16W
R857	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R858	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R859	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R860	NRSA63D-912X	M.G.RESISTOR	9.1k	1/16W
R861	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R862	NRSA63D-224X	M.G.RESISTOR	220k	1/16W
R864	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R865	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R867	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R868	NRSA63D-274X	M.G.RESISTOR	270k	1/16W
R869	NRSA63D-561X	M.G.RESISTOR	560	1/16W
R870	NRSA63D-513X	M.G.RESISTOR	51k	1/16W
R871	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R872	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R873	NRSA63D-334X	M.G.RESISTOR	330k	1/16W

[CAM2]

Symbol No.	Part No.	Part Name	Description	
R874	NRSA63D-473X	M.G.RESISTOR	47k	1/16W
R875	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R876	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R877	NRSA63D-821X	M.G.RESISTOR	820	1/16W
R878	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R879	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R880	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R881	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R882	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R883	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R884	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R885	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R886	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R887	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R888	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R889	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R890	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R891	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R892	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R893	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R901	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R908	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R911	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R912	NRSA63D-562X	M.G.RESISTOR	5.6k	1/16W
R913	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R914	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R915	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R916	NRSA63D-563X	M.G.RESISTOR	56k	1/16W
R917	NRSA63D-562X	M.G.RESISTOR	5.6k	1/16W
R918	NRSA63D-471X	M.G.RESISTOR	470	1/16W
R919	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R921	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R922	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R923	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R924	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R925	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R926	NRSA63D-560X	M.G.RESISTOR	56	1/16W
R927	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R929	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R930	NRSA63D-474X	M.G.RESISTOR	470k	1/16W
R931	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R932	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R933	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R934	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R935	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R937	NRSA63D-562X	M.G.RESISTOR	5.6k	1/16W
R938	NRSA63D-101X	M.G.RESISTOR	100	1/16W
R939	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R940	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R941	NRSA63D-473X	M.G.RESISTOR	47k	1/16W
R942	NRSA63D-473X	M.G.RESISTOR	47k	1/16W
R943	NRSA63D-100X	M.G.RESISTOR	10	1/16W
R945	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R946	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
VR801	NVP1313-502X	TRIM.RESISTOR	5k	CHROMA
C101	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C102	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C103	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C104	NCB10JM-335X	CER.CAPACITOR	3.3	6.3V
C105	NCB10JM-335X	CER.CAPACITOR	3.3	6.3V
C106	NCB10JM-335X	CER.CAPACITOR	3.3	6.3V
C107	NCB10JM-335X	CER.CAPACITOR	3.3	6.3V
C108	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C109	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C110	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C111	NCB11CK-105X	CER.CAPACITOR	1	16V
C112	NCB11CK-105X	CER.CAPACITOR	1	16V
C113	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C115	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C116	NCB31CK-473X	CER.CAPACITOR	0.047	16V

Symbol No.	Part No.	Part Name	Description	
C117	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C120	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C121	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C122	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C123	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C124	NDC31HJ-681X	CER.CAPACITOR	680p	50V
C125	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C126	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C127	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C128	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C129	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C130	NBE21EM-105X	TAN.CAPACITOR	1	25V
C131	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C132	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C133	NBE21EM-105X	TAN.CAPACITOR	1	25V
C135	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C136	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C138	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C139	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C140	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C142	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C143	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C144	NBE21EM-105X	TAN.CAPACITOR	1	25V
C145	NCB11CK-105X	CER.CAPACITOR	1	16V
C146	SVC341/L/-X	VARI CAPA DIODE	SANYO	
C148	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C149	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C182	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C455	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C456	NCB11CK-105X	CER.CAPACITOR	1	16V
C458	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C459	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C467	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C468	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C469	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C481	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C482	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C483	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C484	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C485	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C486	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C487	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C488	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C489	NDC31HJ-151X	CER.CAPACITOR	150p	50V
C490	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C555	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C556	NCB11CK-105X	CER.CAPACITOR	1	16V
C567	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C568	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C569	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C581	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C582	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C583	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C584	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C585	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C586	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C587	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C588	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C589	NDC31HJ-151X	CER.CAPACITOR	150p	50V
C590	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C655	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C656	NCB11CK-105X	CER.CAPACITOR	1	16V
C657	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C658	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C667	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C668	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C669	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C681	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C682	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C683	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C684	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C685	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C686	NCB31CK-473X	CER.CAPACITOR	0.047	16V

Symbol No.	Part No.	Part Name	Description	
C687	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C688	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C689	NDC31HJ-151X	CER.CAPACITOR	150p	50V
C690	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C692	NBE71CM-476X	TAN.CAPACITOR	47	16V
C693	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C694	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C696	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C698	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C701	NEH91HM-335X	E.CAPACITOR	3.3	50V
C702	NCB31CK-223X	CER.CAPACITOR	0.022	16V
C703	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C704	NEX21AM-106X	E.CAPACITOR	10	10V
C705	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C706	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C707	NEH91HM-335X	E.CAPACITOR	3.3	50V
C708	NBE21EM-105X	TAN.CAPACITOR	1	25V
C709	NCB11CK-105X	CER.CAPACITOR	1	16V
C711	NEH91HM-335X	E.CAPACITOR	3.3	50V
C713	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C714	NEX21AM-106X	E.CAPACITOR	10	10V
C715	NEH91HM-335X	E.CAPACITOR	3.3	50V
C716	NEH91HM-335X	E.CAPACITOR	3.3	50V
C717	NEH91HM-335X	E.CAPACITOR	3.3	50V
C750	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C751	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C752	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C753	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C754	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C755	NBE21EM-105X	TAN.CAPACITOR	1	25V
C756	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C758	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C759	NCB11CK-105X	CER.CAPACITOR	1	16V
C761	NBSH1AM-227X	TAN.CAPACITOR	220	10V
C762	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C763	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C801	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C802	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C803	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C804	NCB10JM-335X	CER.CAPACITOR	3.3	6.3V
C805	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C806	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C807	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C808	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C809	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C810	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C811	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C812	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C813	NCB10JM-335X	CER.CAPACITOR	3.3	6.3V
C814	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C815	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C816	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C817	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C819	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C820	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C821	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C822	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C823	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C824	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C825	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C826	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C827	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C828	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C829	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C836	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C837	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C838	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C839	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C840	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C841	NDC31HJ-180X	CER.CAPACITOR	18p	50V
C842	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C844	NCB31CK-473X	CER.CAPACITOR	0.047	16V

Symbol No.	Part No.	Part Name	Description	
C845	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C846	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C847	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C848	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C849	NDC31HJ-180X	CER.CAPACITOR	18p	50V
C850	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C852	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C853	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C854	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C855	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C856	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C857	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C858	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C859	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C860	NDC31HJ-470X	CER.CAPACITOR	47p	50V
C863	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C864	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C866	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C867	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C901	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C902	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C903	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C914	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C915	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C916	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C917	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C918	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C919	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C920	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C921	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C922	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C924	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C925	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C926	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C927	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C928	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C929	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C930	NCB11CK-105X	CER.CAPACITOR	1	16V
C931	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C932	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C933	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C934	NCB31CK-473X	CER.CAPACITOR	0.047	16V
L804	NQL054K-150X	COIL	15uH	
L805	NQL054K-150X	COIL	15uH	
L807	NQL054K-150X	COIL	15uH	
L808	NQL054K-150X	COIL	15uH	
LC101	NQR0122-001X	LC FILTER		
LC102	EXC-CET471U	LC FILTER		
LC750	EXC-CET471U	LC FILTER		
LC752	EXC-CET471U	LC FILTER		
LC754	EXC-CET471U	LC FILTER		
LC801	EXC-CET471U	LC FILTER		
LC802	EXC-CET471U	LC FILTER		
X101	QAX0124-002	CRYSTAL	27MHz	
CN1	QGB0805M3-60X	CONNECTOR	60PIN	
CN2	QGB0805M3-60X	CONNECTOR	60PIN	
CN3	QGF0508F1-33X	CONNECTOR	33PIN	
CN4	QGF0508F1-30X	CONNECTOR	30PIN	
CN5	QGA1201F2-04X	CONNECTOR	4PIN	
CN21	QGF0508F2-50X	CONNECTOR	50PIN	
CN22	QGA1201F2-06X	CONNECTOR	6PIN	
CN32	QGA1201C2-06X	CONNECTOR	6PIN	
CN33	QGA1201F2-03X	CONNECTOR	3PIN	
CN34	QGA1501F2-04W	CONNECTOR	4PIN	
CN46	QGA1501F2-03W	CONNECTOR	3PIN	
K901	SCV2732-2HM471	FERRITE BEADS		
K902	SCV2732-2HM471	FERRITE BEADS		
K903	SCV2732-2HM471	FERRITE BEADS		
K904	SCV2732-2HM471	FERRITE BEADS		
K905	SCV2732-2HM471	FERRITE BEADS		

6.12 PS1 BOARD ASSEMBLY PARTS LIST 1 7

SCK2609-01-01B 1 7 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC201	LM2598S-ADJ-X	I.C.(M)	NATIONAL SEMICO	
IC202	LM2598S-ADJ-X	I.C.(M)	NATIONAL SEMICO	
IC203	LM2598S-ADJ-X	I.C.(M)	NATIONAL SEMICO	
IC206	LM2597M-ADJ-X	I.C.(M)	NATIONAL SEMICO	
Q211	DTC124EUA-X	TRANSISTOR	ROHM	
Q212	DTC124EUA-X	TRANSISTOR	ROHM	
Q213	DTC124EUA-X	TRANSISTOR	ROHM	
Q214	DTA124EUA-X	TRANSISTOR	ROHM	
Q215	DTC124EUA-X	TRANSISTOR	ROHM	
Q217	DTA124EUA-X	TRANSISTOR	ROHM	
Q218	DTC124EUA-X	TRANSISTOR	ROHM	
D201	RB050L-40-X	SB DIODE	ROHM	
D202	RB050L-40-X	SB DIODE	ROHM	
D203	MA736-X	DIODE	MATSUSHITA	
D204	MA736-X	DIODE	MATSUSHITA	
D207	MA736-X	DIODE	MATSUSHITA	
D208	MA736-X	DIODE	MATSUSHITA	
R201	NRSA63D-392X	M.G.RESISTOR	3.9k	1/16W
R202	NRSA63D-122X	M.G.RESISTOR	1.2k	1/16W
R204	NRSA63D-182X	M.G.RESISTOR	1.8k	1/16W
R205	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R207	NRSA63D-392X	M.G.RESISTOR	3.9k	1/16W
R208	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R209	NRSA63D-272X	M.G.RESISTOR	2.7k	1/16W
R218	NRSA63D-822X	M.G.RESISTOR	8.2k	1/16W
R219	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R220	NRSA63D-121X	M.G.RESISTOR	120	1/16W
C201	QTX81EM-336	OS CAPACITOR	33	25V
C202	NBSH1AM-227X	TAN.CAPACITOR	220	10V
C203	NBSH1AM-227X	TAN.CAPACITOR	220	10V
C204	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C205	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C207	QTX81EM-336	OS CAPACITOR	33	25V
C208	NBSH0JM-337X	TAN.CAPACITOR	330	6.3V
C209	NBSH0JM-337X	TAN.CAPACITOR	330	6.3V
C210	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C211	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C213	QTX81EM-336	OS CAPACITOR	33	25V
C214	NBSH1AM-227X	TAN.CAPACITOR	220	10V
C217	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C225	QEX41FM-106	E.CAPACITOR	10	31.5V
C226	NEX31CM-686X	E.CAPACITOR	68	16V
C227	NEX31CM-686X	E.CAPACITOR	68	16V
C228	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C229	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C253	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C255	QTX81EM-336	OS CAPACITOR	33	25V
L202	NQL47CM-680X	COIL	68uH	
L203	NQL29CM-680X	COIL	68uH	
L204	NQL46CM-470X	COIL	47uH	
L205	NQL44CM-3R3X	COIL	3.3uH	
L206	NQL47CM-151X	COIL	150uH	
L207	NQL29CM-680X	COIL	68uH	
L212	NQL44CM-470X	COIL	47uH	
L213	NQL03FK-151X	COIL	150uH	
L214	NQL29CM-150X	COIL	15uH	
CN44	QGB0805L2-30X	CONNECTOR	30PIN	

6.13 PS2 BOARD ASSEMBLY PARTS LIST 1 8

SCK2609-02-01B 1 8 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC204	MAX771ESA-X	I.C.(M)	MAXIM	
IC205	MAX772ESA-X	I.C.(M)	MAXIM	
IC211	NJM78L05UA-X	I.C.(M)	JRC	
IC212	TC7SH04FU-X	I.C.(M)	TOSHIBA	
IC213	TC74VHC08FT-X	I.C.(M)	TOSHIBA	
IC214	TC7S02FU-X	I.C.(M)	TOSHIBA	
IC215	TC7SH32FU-X	I.C.(M)	TOSHIBA	
Q201	HAT2020R-X	TRANSISTOR	HITACHI	
Q202	HAT2020R-X	TRANSISTOR	HITACHI	
Q216	DTA124EUA-X	TRANSISTOR	ROHM	
Q221	2SB1073/PQ/-X	TRANSISTOR	MATSUSHITA	
Q222	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA	
Q231	DTA124EUA-X	TRANSISTOR	ROHM	
Q232	DTC124EUA-X	TRANSISTOR	ROHM	
Q235	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA	
Q236	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA	
Q238	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA	
Q239	HAT2020R-X	TRANSISTOR	HITACHI	
Q240	DTA124EUA-X	TRANSISTOR	ROHM	
Q241	DTC124EUA-X	TRANSISTOR	ROHM	
Q250	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA	
Q251	2SC4626/BC/-X	TRANSISTOR	MATSUSHITA	
D205	MA736-X	DIODE	MATSUSHITA	
D206	MA736-X	DIODE	MATSUSHITA	
R210	NRZ0055-R39X	M.F.RESISTOR	0.39	1W
R211	NRSA63D-473X	M.G.RESISTOR	47k	1/16W
R212	NRSA63D-562X	M.G.RESISTOR	5.6k	1/16W
R213	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R214	NRZ0055-R39X	M.F.RESISTOR	0.39	1W
R215	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R216	NRSA63D-183X	M.G.RESISTOR	18k	1/16W
R217	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R221	NRSA02J-3R3X	M.G.RESISTOR	3.3	1/10W
R222	NRSA02J-3R3X	M.G.RESISTOR	3.3	1/10W
R223	NRSA02J-3R3X	M.G.RESISTOR	3.3	1/10W
R224	NRSA02J-100X	M.G.RESISTOR	10	1/10W
R225	NRSA02J-100X	M.G.RESISTOR	10	1/10W
R226	NRSA02J-220X	M.G.RESISTOR	22	1/10W
R227	NRSA02J-220X	M.G.RESISTOR	22	1/10W
R231	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R232	NRSA63D-152X	M.G.RESISTOR	1.5k	1/16W
R233	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R234	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R241	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R242	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R243	NRSA63D-333X	M.G.RESISTOR	33k	1/16W
R244	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R245	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R246	NRSA63D-683X	M.G.RESISTOR	68k	1/16W
R247	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R248	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R249	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R252	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R253	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R261	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R262	NRSA63D-223X	M.G.RESISTOR	22k	1/16W
R263	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R300	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R301	NRSA63D-104X	M.G.RESISTOR	100k	1/16W
R302	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R303	NRSA63D-473X	M.G.RESISTOR	47k	1/16W
R304	NRSA63D-101X	M.G.RESISTOR	100	1/16W
C219	NBSG1CM-476X	TAN.CAPACITOR	47	16V
C220	NBSG1CM-476X	TAN.CAPACITOR	47	16V
C221	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C222	QEX41EM-476	E.CAPACITOR	47	25V
C223	QEX41EM-476	E.CAPACITOR	47	25V
C224	NCB31CK-104X	CER.CAPACITOR	0.1	16V

Symbol No.	Part No.	Part Name	Description
C231	NBSH1AM-227X	TAN.CAPACITOR	220 10V
C232	NBSG1CM-476X	TAN.CAPACITOR	47 16V
C233	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C234	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C242	QTX81EM-685	OS CAPACITOR	6.8 25V
C243	NCB21AK-105X	CER.CAPACITOR	1 10V
C244	NBE71CM-476X	TAN.CAPACITOR	47 16V
C251	NCB21EK-104X	CER.CAPACITOR	0.1 25V
C256	QTX81EM-336	OS CAPACITOR	33 25V
C257	QTX81EM-336	OS CAPACITOR	33 25V
C258	NBSG1CM-476X	TAN.CAPACITOR	47 16V
C259	NBSG1CM-476X	TAN.CAPACITOR	47 16V
C260	NBSG1CM-476X	TAN.CAPACITOR	47 16V
C261	NBSG1CM-476X	TAN.CAPACITOR	47 16V
C262	NBSG1CM-476X	TAN.CAPACITOR	47 16V
C263	NBSG1CM-476X	TAN.CAPACITOR	47 16V
L201	NQL47CM-220X	COIL	22uH
L208	NQL47CM-221X	COIL	220uH
L210	NQL47CM-221X	COIL	220uH
TH201	NAD0024-001X	THERMISTOR	
TH202	NAD0024-001X	THERMISTOR	
TH203	NAD0024-001X	THERMISTOR	
TH204	NAD0024-001X	THERMISTOR	
TH205	NAD0024-001X	THERMISTOR	
TH206	NAD0024-001X	THERMISTOR	
TH207	NAD0026-001X	THERMISTOR	
TH208	NAD0024-003X	THERMISTOR	
TH209	NAD0024-003X	THERMISTOR	
TH210	NAD0024-001X	THERMISTOR	
CN41	QGA2001C2-05X	CONNECTOR	5PIN
CN43	QGA1201F2-04X	CONNECTOR	4PIN
CN44	QGB0805M3-30X	CONNECTOR	30PIN
CN45	QGA1201F2-15X	CONNECTOR	15PIN
CN46	QGA1201C2-03X	CONNECTOR	3PIN
CN144	QGB0805K1-30X	CONNECTOR	30PIN

6.14 ROM BOARD ASSEMBLY PARTS LIST 19

SCK2607-01-00B 19☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
SK902	SCV2768-001X	IC SOCKET	
IC902	PLSC1278	I.C.(M)	MBM29F002T-70PD
IC1901	TC74VHC165FT-X	I.C.(M)	TOSHIBA
R1901	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R1902	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R1903	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R1904	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R1905	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R1906	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R1907	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R1908	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
C920	NBE41CM-106X	TAN.CAPACITOR	10 16V
C921	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C922	NCB31CK-473X	CER.CAPACITOR	0.047 16V
S901	NSW0022-004X	DIP SWITCH	
CN24	QGB0805L1-40X	CONNECTOR	40PIN

6.15 JOG BOARD ASSEMBLY PARTS LIST 20

SCK2607-02-00B 20☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC951	TC7S14FU-X	I.C.(M)	TOSHIBA
IC952	TC7SH00FU-X	I.C.(M)	TOSHIBA
IC953	TC7SU04FU-X	I.C.(M)	TOSHIBA
IC954	TC7W74FU-X	I.C.(M)	TOSHIBA
IC955	TC7S14FU-X	I.C.(M)	TOSHIBA
IC956	TC7S08FU-X	I.C.(M)	TOSHIBA
R951	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R952	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R953	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R954	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R955	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R956	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R957	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R958	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R960	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R962	NRSA63J-101X	M.G.RESISTOR	100 1/16W
C951	NCB31HK-103X	CER.CAPACITOR	0.01 50V
C952	NCB31HK-103X	CER.CAPACITOR	0.01 50V
C953	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C954	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C955	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C956	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C957	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C958	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C959	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C960	NBE41CM-106X	TAN.CAPACITOR	10 16V
C961	NCB31CK-473X	CER.CAPACITOR	0.047 16V
S951	NSW0010-001X	SWITCH	STATUS/MENU
S952	QSW0603-001	ROTARY SWITCH	SHUTTER/MENU
CN38	QGA1201F2-06X	CONNECTOR	6PIN

6.16 IF BOARD ASSEMBLY PARTS LIST 2 1

SCK2607-03-00B

2 1 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC301	M62353GP-X	I.C.(M)	MITSUBISHI
IC302	TA75S01F-X	I.C.(M)	TOSHIBA
IC303	TC7W66FU-X	I.C.(M)	TOSHIBA
D301	MA143A-X	DIODE	MATSUSHITA
D302	MA143A-X	DIODE	MATSUSHITA
D303	MA143A-X	DIODE	MATSUSHITA
D304	MA143A-X	DIODE	MATSUSHITA
D305	MA143A-X	DIODE	MATSUSHITA
D306	MA143A-X	DIODE	MATSUSHITA
D307	MA143A-X	DIODE	MATSUSHITA
D308	MA143A-X	DIODE	MATSUSHITA
D309	HZM18NB2-X	ZENER DIODE	HITACHI
R301	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R302	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R303	NRSA63J-334X	M.G.RESISTOR	330k 1/16W
R304	NRSA63J-124X	M.G.RESISTOR	120k 1/16W
R305	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R306	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R311	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R312	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R313	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R315	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R316	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R317	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R318	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R320	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R321	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R322	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R323	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
C301	NBE41CM-106X	TAN.CAPACITOR	10 16V
C302	NBE51VM-475X	TAN.CAPACITOR	4.7 35V
C303	NBE41CM-106X	TAN.CAPACITOR	10 16V
C304	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C305	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C306	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C307	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C308	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C310	NEH91EM-106X	E.CAPACITOR	10 25V
C312	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C313	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C314	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C315	NCB31CK-473X	CER.CAPACITOR	0.047 16V
CN23	QGF0508C1-30W	CONNECTOR	30PIN
CN31	QGA1201C2-10X	CONNECTOR	10PIN
CN35	SCV2477-010	CONNECTOR	10PIN
CN36	QGF0508C1-15W	CONNECTOR	15PIN

6.17 SWRU BOARD ASSEMBLY PARTS LIST 2 2

SCK2607-04-00B

2 2 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC341	TC74VHC165FT-X	I.C.(M)	TOSHIBA
IC342	TC74VHC165FT-X	I.C.(M)	TOSHIBA
Q341	DTC124EUA-X	TRANSISTOR	ROHM
LD341	AA1102W-X	L.E.D.	FAS
R341	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R342	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R343	NRSA63J-471X	M.G.RESISTOR	470 1/16W
R344	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R345	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R346	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R347	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R348	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R349	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R350	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R351	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R353	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R354	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R355	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R356	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R357	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R358	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R359	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
C342	NBE41CM-106X	TAN.CAPACITOR	10 16V
C343	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C344	NCB31CK-473X	CER.CAPACITOR	0.047 16V
S341	NSW0070-002X	SLIDE SWITCH	AUTO IRIS
S342	NSW0010-001X	SWITCH	FULL AUTO
S343	NSW0070-002X	SLIDE SWITCH	BLACK
S344	NSW0010-001X	SWITCH	LOLUX
CN36	QGF0508F1-15X	CONNECTOR	15PIN
CN37	SCV2644-110X	CONNECTOR	11PIN
CN38	QGA1201F2-06X	CONNECTOR	6PIN

6.18 SWF BOARD ASSEMBLY PARTS LIST 2 3
SCK2606-01-00B 2 3 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC321	TC74HC165AF-X	I.C.(M)	TOSHIBA
D321	MA143A-X	DIODE	MATSUSHITA
D322	MA143A-X	DIODE	MATSUSHITA
D324	MA143A-X	DIODE	MATSUSHITA
D325	MA143A-X	DIODE	MATSUSHITA
D329	MA143A-X	DIODE	MATSUSHITA
R321	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R322	NRSA02J-562X	M.G.RESISTOR	5.6k 1/10W
R323	NRSA02J-103X	M.G.RESISTOR	10k 1/10W
R324	NRSA02J-183X	M.G.RESISTOR	18k 1/10W
R325	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R326	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R327	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R328	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R329	NRSA02J-334X	M.G.RESISTOR	330k 1/10W
R330	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R331	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R332	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R333	NRSA02J-101X	M.G.RESISTOR	100 1/10W
R334	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
VR301	QVQ0280-A14	VAL.RESISTOR	10k AUDIO LEV
C321	NCB21EK-473X	CER.CAPACITOR	0.047 25V
C322	NCB21EK-473X	CER.CAPACITOR	0.047 25V
C323	NCB21EK-473X	CER.CAPACITOR	0.047 25V
C324	NCB21EK-473X	CER.CAPACITOR	0.047 25V
C325	NBE41CM-106X	TAN.CAPACITOR	10 16V
S301	QSW0052-004	TOGGLE SWITCH	ACCU FOCUS/WHIT
S302	QSW0189-001Z	SWITCH	VTR TRIG
S303	QSW0052-005	TOGGLE SWITCH	ZEBRA/SKIN AREA
S304	QSW0189-001Z	SWITCH	TAKE
CN10	QGA1501F1-05	CONNECTOR	5PIN
CN35	QGF1004F1-10	CONNECTOR	10PIN

6.19 SWRM BOARD ASSEMBLY PARTS LIST 2 4
SCK2606-02-00B 2 4 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
D361	HZM6C-X	ZENER DIODE	HITACHI
D362	HZM6C-X	ZENER DIODE	HITACHI
D363	HZM6C-X	ZENER DIODE	HITACHI
D364	HZM6C-X	ZENER DIODE	HITACHI
D365	HZM6C-X	ZENER DIODE	HITACHI
D366	HZM6C-X	ZENER DIODE	HITACHI
D367	HZM6C-X	ZENER DIODE	HITACHI
R361	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
R362	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
R363	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
R364	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
R365	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
R366	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
R367	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
S361	QSW0048-001	TOGGLE SWITCH	VTR
S362	QSW0052-001	TOGGLE SWITCH	GAIN
S363	QSW0049-001	TOGGLE SWITCH	OUTPUT
S364	QSW0049-001	TOGGLE SWITCH	WHITE BAL
CN37	QGF1004F1-10	CONNECTOR	10PIN
CN40	QGA1501F1-03	CONNECTOR	3PIN

6.20 SWRB BOARD ASSEMBLY PARTS LIST 2 5
SCK2606-03-00B 2 5 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
C381	NCB21EK-473X	CER.CAPACITOR	0.047 25V
S381	QSW0189-001Z	SWITCH	NG
CN39	QGA1501F1-02	CONNECTOR	2PIN

6.21 SWPW BOARD ASSEMBLY PARTS LIST 2 6
SCK2606-05-00B 2 6 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
D391	HZM6C-X	ZENER DIODE	HITACHI
R391	NRSA02J-222X	M.G.RESISTOR	2.2k 1/10W
S391	QSW0046-001	TOGGLE SWITCH	POWER
CN39	QGA1501C1-02	CONNECTOR	2PIN
CN40	QGA1501C1-03	CONNECTOR	3PIN

6.22 MIC BOARD ASSEMBLY PARTS LIST 27

SCK2606-06-00B 27☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
R396	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R397	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
C398	NDC21HJ-221X	CER.CAPACITOR	220p 50V
C399	NDC21HJ-221X	CER.CAPACITOR	220p 50V
C1303	NDC21HJ-221X	CER.CAPACITOR	220p 50V
C1304	NDC21HJ-221X	CER.CAPACITOR	220p 50V
L396	NQL124J-101X	COIL	100uH
L397	NQL124J-101X	COIL	100uH
J396	QNZ0414-001	JACK	MIC
CN33	QGA1501C1-03	CONNECTOR	3PIN
K396	SCV2662-027	FERRITE BEADS	
K397	SCV2662-027	FERRITE BEADS	

6.23 BNC BOARD ASSEMBLY PARTS LIST 28

SCK2606-07-00B 28☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
R399	NRSA02J-750X	M.G.RESISTOR	75 1/10W
CN34	QGA1501C1-04	CONNECTOR	4PIN
K1301	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
K1302	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W

6.24 VIDEO/SYSCON BOARD ASSEMBLY PARTS LIST 31

SLK2092-U0B(U)

SLK2092-P0B(E) 31☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	TC4W53F-X	I.C.(M)	TOSHIBA (U)
IC2	TC74HC4538AF-X	I.C.(M)	TOSHIBA (U)
IC3	TC74HC4538AF-X	I.C.(M)	TOSHIBA (U)
IC4	MM1117XF-X	I.C.(M)	MITSUMI (U)
IC5	NJM2538V-X	I.C.(M)	JRC
IC401	UPD784031GK-BE9	I.C.(M)	NEC
IC402	TC74VHC373FT-X	I.C.(M)	TOSHIBA
IC403	PLSL1063	I.C.(M)	MBM29F002B-70PD
SK403	SCV2768-001X	IC SOCKET	32PIN
IC404	CY62256LL70SN-X	I.C.(M)	CYPRESS
IC405	UPD71055GB-10	I.C.(M)	NEC
IC406	TC74VHC139FT-X	I.C.(M)	TOSHIBA
IC407	X24645S8-2.7-X	I.C.(M)	XICOR
IC408	M51957BFP-X	I.C.(M)	MITSUBISHI
IC409	TC7S14FU-X	I.C.(M)	TOSHIBA
IC410	TC74VHC244FT-X	I.C.(M)	TOSHIBA
IC411	TC7W04FU-X	I.C.(M)	TOSHIBA
IC412	TC74VHC74FT-X	I.C.(M)	TOSHIBA
IC413	TC74VHC125FT-X	I.C.(M)	TOSHIBA
IC414	TC7W04FU-X	I.C.(M)	TOSHIBA
Q1	2SA1774/QRS/-X	TRANSISTOR	ROHM (U)
Q2	2SC4617/RS/-X	TRANSISTOR	ROHM (U)
Q3	2SA1774/QRS/-X	TRANSISTOR	ROHM (U)
Q4	DTC144EUA-X	TRANSISTOR	ROHM (U)
Q5	2SA1774/QRS/-X	TRANSISTOR	ROHM (U)
Q6	2SA1774/QRS/-X	TRANSISTOR	ROHM (U)
Q8	2SC4617/RS/-X	TRANSISTOR	ROHM (U)
Q9	2SC4617/RS/-X	TRANSISTOR	ROHM (U)
Q10	2SC4617/RS/-X	TRANSISTOR	ROHM (U)
Q11	2SA1774/QRS/-X	TRANSISTOR	ROHM (U)
Q12	2SC4617/RS/-X	TRANSISTOR	ROHM (U)
Q13	2SC4617/RS/-X	TRANSISTOR	ROHM (U)
Q14	2SA1774/QRS/-X	TRANSISTOR	ROHM (U)
Q15	2SC4617/RS/-X	TRANSISTOR	ROHM (U)
Q17	2SA1774/QRS/-X	TRANSISTOR	ROHM (U)
Q18	DTC144EUA-X	TRANSISTOR	ROHM
Q19	DTC144EUA-X	TRANSISTOR	ROHM
Q20	2SA1774/QRS/-X	TRANSISTOR	ROHM
Q22	DTC114EUA-X	TRANSISTOR	ROHM (U)
Q401	DTC124EUA-X	TRANSISTOR	ROHM
Q402	DTC124EUA-X	TRANSISTOR	ROHM
Q403	DTA114EUA-X	TRANSISTOR	ROHM
Q404	DTC124EUA-X	TRANSISTOR	ROHM
D1	DAN202U-X	DIODE	ROHM (U)
D2	DAN202U-X	DIODE	ROHM (U)
D3	DAN202U-X	DIODE	ROHM (U)
D401	DAN202U-X	DIODE	ROHM
D402	MA8100/L/-X	ZENER DIODE	MATSUSHITA
D403	DAN202U-X	DIODE	ROHM
R1	NRSA63J-473X	M.G.RESISTOR	47k 1/16W (U)
R2	NRSA63J-333X	M.G.RESISTOR	33k 1/16W (U)
R3	NRSA63J-561X	M.G.RESISTOR	560 1/16W (U)
R4	NRSA63J-101X	M.G.RESISTOR	100 1/16W (U)
R5	NRSA63J-561X	M.G.RESISTOR	560 1/16W (U)
R6	NRSA63J-273X	M.G.RESISTOR	27k 1/16W (U)
R7	NRSA63J-183X	M.G.RESISTOR	18k 1/16W (U)
R8	NRSA63J-561X	M.G.RESISTOR	560 1/16W (U)
R9	NRVA02D-102X	C.M.F.RESISTOR	1k 1/10W (U)
R10	NRVA02D-820X	C.M.F.RESISTOR	82 1/10W (U)
R11	NRVA02D-103X	C.M.F.RESISTOR	10k 1/10W
R12	NRVA02D-103X	C.M.F.RESISTOR	10k 1/10W
R13	NRSA63J-561X	M.G.RESISTOR	560 1/16W (U)
R14	NRVA02D-103X	C.M.F.RESISTOR	10k 1/10W
R15	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W (E)
R16	NRVA02D-103X	C.M.F.RESISTOR	10k 1/10W
R17	NRSA63J-223X	M.G.RESISTOR	22k 1/16W (U)

Symbol No.	Part No.	Part Name	Description	
R18	NRSA63J-101X	M.G.RESISTOR	100	1/16W (U)
R19	NRSA63J-273X	M.G.RESISTOR	27k	1/16W (U)
R20	NRSA63J-473X	M.G.RESISTOR	47k	1/16W (U)
R21	NRSA63J-561X	M.G.RESISTOR	560	1/16W (U)
R22	NRVA02D-750X	C.M.F.RESISTOR	75	1/10W (U)
R23	NRVA02D-822X	C.M.F.RESISTOR	8.2k	1/10W (U)
R24	NRSA63J-122X	M.G.RESISTOR	1.2k	1/16W (U)
R25	NRVA02D-151X	C.M.F.RESISTOR	150	1/10W (U)
R26	NRVA02D-102X	C.M.F.RESISTOR	1k	1/10W (U)
R27	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W (U)
R28	NRVA02D-333X	C.M.F.RESISTOR	33k	1/10W (U)
R29	NRVA02D-332X	C.M.F.RESISTOR	3.3k	1/10W (U)
R30	NRSA63J-103X	M.G.RESISTOR	10k	1/16W (U)
R31	NRSA63J-331X	M.G.RESISTOR	330	1/16W (U)
R32	NRSA63J-104X	M.G.RESISTOR	100k	1/16W (U)
R33	NRVA02D-223X	C.M.F.RESISTOR	22k	1/10W (U)
R34	NRVA02D-392X	C.M.F.RESISTOR	3.9k	1/10W (U)
R35	NRVA02D-122X	C.M.F.RESISTOR	1.2k	1/10W (U)
R36	NRVA02D-182X	C.M.F.RESISTOR	1.8k	1/10W (U)
R37	NRVA02D-471X	C.M.F.RESISTOR	470	1/10W (U)
R38	NRVA02D-681X	C.M.F.RESISTOR	680	1/10W (U)
R39	NRVA02D-271X	C.M.F.RESISTOR	270	1/10W (U)
R40	NRSA63J-102X	M.G.RESISTOR	1k	1/16W (U)
R41	NRVA02D-391X	C.M.F.RESISTOR	390	1/10W (U)
R42	NRVA02D-391X	C.M.F.RESISTOR	390	1/10W (U)
R43	NRVA02D-390X	C.M.F.RESISTOR	39	1/10W (U)
R48	NRSA63J-152X	M.G.RESISTOR	1.5k	1/16W (U)
R49	NRVA02D-102X	C.M.F.RESISTOR	1k	1/10W (U)
R50	NRVA02D-472X	C.M.F.RESISTOR	4.7k	1/10W (U)
R51	NRVA02D-683X	C.M.F.RESISTOR	68k	1/10W (U)
R52	NRVA02D-153X	C.M.F.RESISTOR	15k	1/10W (U)
R54	NRSA63J-103X	M.G.RESISTOR	10k	1/16W (U)
R55	NRSA63J-223X	M.G.RESISTOR	22k	1/16W (U)
R57	NRSA63J-223X	M.G.RESISTOR	22k	1/16W (U)
R58	NRSA63J-473X	M.G.RESISTOR	47k	1/16W (U)
R59	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W (E)
R60	NRSA63J-560X	M.G.RESISTOR	56	1/16W
R61	NRSA63J-224X	M.G.RESISTOR	220k	1/16W
R62	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R63	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R64	NRSA63J-225X	M.G.RESISTOR	2.2M	1/16W
R65	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R66	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R67	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R68	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R69	NRVA02D-102X	C.M.F.RESISTOR	1k	1/10W
R70	NRVA02D-102X	C.M.F.RESISTOR	1k	1/10W
R71	NRSA63J-681X	M.G.RESISTOR	680	1/16W
R72	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W (U)
R73	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R74	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R75	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R76	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R77	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R79	NRSA63J-562X	M.G.RESISTOR	5.6k	1/16W (U)
R80	NRSA63J-101X	M.G.RESISTOR	100	1/16W (U)
R81	NRSA63J-103X	M.G.RESISTOR	10k	1/16W (U)
R82	NRSA63J-105X	M.G.RESISTOR	1M	1/16W (U)
R83	NRSA63J-105X	M.G.RESISTOR	1M	1/16W (U)
R84	NRSA63J-103X	M.G.RESISTOR	10k	1/16W (U)
R86	QRE141J-271Y	CAR.RESISTOR	270	1/4W (U)
R401	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R402	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R403	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R404	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R405	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R406	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R407	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R408	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R409	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R410	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R411	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R412	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R413	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R414	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R415	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R416	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R417	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R418	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R419	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R420	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R421	NRSA63J-104X	M.G.RESISTOR	100k	1/16W (E)
R422	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R423	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R424	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R425	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R426	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R427	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R428	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R429	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R430	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R431	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R432	NRSA63J-822X	M.G.RESISTOR	8.2k	1/16W
R433	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R434	NRSA63J-681X	M.G.RESISTOR	680	1/16W
R436	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R437	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R439	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R440	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R441	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R442	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R443	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R444	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R445	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R446	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R447	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R448	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R449	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R450	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R451	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R452	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R453	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R454	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R455	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R456	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R457	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R458	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R459	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R460	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R461	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R462	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R463	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R464	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R465	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R466	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R467	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R468	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R469	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R470	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R471	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R472	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R473	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R474	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R475	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R494	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R495	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R496	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R497	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R498	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R499	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R500	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R506	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R509	NRSA63J-104X	M.G.RESISTOR	100k	1/16W (U)
R510	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R511	NRSA63J-104X	M.G.RESISTOR	100k	1/16W

[VIDEO/SYSCON]

Symbol No.	Part No.	Part Name	Description
VR2	NVP1415-502X	TRIM.RESISTOR	5k STA P (U)
VR3	NVP1415-103X	TRIM.RESISTOR	10k STO P (U)
VR4	NVP1415-103X	TRIM.RESISTOR	10k DEL P (U)
VR5	NVP1415-503X	TRIM.RESISTOR	50k C LEVEL
VR6	NVP1415-503X	TRIM.RESISTOR	50k Y LEVEL
C1	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C2	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C3	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C4	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C5	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C6	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C7	NCB41CM-106X	CER.CAPACITOR	10 16V (U)
C8	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C9	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C10	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C11	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C12	NEH91CM-476X	E.CAPACITOR	47 16V (U)
C13	NEH91CM-476X	E.CAPACITOR	47 16V (U)
C14	NRSA02J-0R0X	M.G.RESISTOR	0 1/16W (U)
C15	NCB41CM-106X	CER.CAPACITOR	10 16V (U)
C16	NCB41CM-106X	CER.CAPACITOR	10 16V (U)
C17	NDC31HJ-150X	CER.CAPACITOR	15p 50V (U)
C19	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C20	NDC31HJ-821X	CER.CAPACITOR	820p 50V (U)
C21	NDC31HJ-101X	CER.CAPACITOR	100p 50V (U)
C22	NDC31HJ-821X	CER.CAPACITOR	820p 50V (U)
C23	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C24	NCB31CK-104X	CER.CAPACITOR	0.1 16V (U)
C25	NDC31HJ-680X	CER.CAPACITOR	68p 50V (U)
C26	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C27	NEH90JM-476X	E.CAPACITOR	47 6.3V (U)
C28	NCF21AZ-475X	CER.CAPACITOR	4.7 10V (U)
C29	NCB41CM-106X	CER.CAPACITOR	10 16V (U)
C30	NCB31EK-103X	CER.CAPACITOR	0.01 25V
C31	NCB31EK-103X	CER.CAPACITOR	0.01 25V
C32	NEX41AM-476X	E.CAPACITOR	47 10V
C33	NCB41CM-106X	CER.CAPACITOR	10 16V
C34	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C35	NCB31EK-103X	CER.CAPACITOR	0.01 25V
C36	NCB31EK-103X	CER.CAPACITOR	0.01 25V
C37	NCB31EK-103X	CER.CAPACITOR	0.01 25V
C38	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C39	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C40	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C41	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C42	NCB41CM-106X	CER.CAPACITOR	10 16V
C43	NCB41CM-106X	CER.CAPACITOR	10 16V
C44	NCB31CK-104X	CER.CAPACITOR	0.1 16V (U)
C45	NCF21AZ-475X	CER.CAPACITOR	4.7 10V (U)
C46	NCF31CZ-334X	CER.CAPACITOR	0.33 16V
C47	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C48	NCB31EK-103X	CER.CAPACITOR	0.01 25V (U)
C50	NCB31EK-103X	CER.CAPACITOR	0.01 25V
C51	NEX41AM-226X	E.CAPACITOR	22 10V
C52	NCB41EM-475X	CER.CAPACITOR	4.7 25V (U)
	NCB41CM-106X	CER.CAPACITOR	10 16V (E)
C53	NCB41CM-106X	CER.CAPACITOR	10 16V
C54	QEKC1CM-336Z	E.CAPACITOR	33 16V (U)
C55	NCB41CM-106X	CER.CAPACITOR	10 16V (U)
C401	NDC31HJ-8R0X	CER.CAPACITOR	8p 50V
C402	NDC31HJ-8R0X	CER.CAPACITOR	8p 50V
C403	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C404	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C405	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C406	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C407	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C408	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C409	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C410	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C411	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C412	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C413	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C414	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C415	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C416	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C417	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C418	NCB31HK-103X	CER.CAPACITOR	0.01 50V
C419	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C420	NCB41CM-106X	CER.CAPACITOR	10 16V
C421	NCB41CM-106X	CER.CAPACITOR	10 16V
C422	NDC31HJ-102X	CER.CAPACITOR	1000p 50V
C423	NDC31HJ-102X	CER.CAPACITOR	1000p 50V
C424	NDC31HJ-102X	CER.CAPACITOR	1000p 50V
L1	NQL024J-471X	COIL	470uH (U)
L2	NQL024J-100X	COIL	10uH (U)
L3	NQL024J-100X	COIL	10uH (U)
L4	NQL024J-100X	COIL	10uH (U)
L5	NQL024J-100X	COIL	10uH
L6	NQL024J-100X	COIL	10uH
L401	NQL024J-100X	COIL	10uH
X401	NAX0320-001X	CRYSTAL	31.9488MHz
CN101	QGF0508F1-40X	CONNECTOR	40PIN
CN401	QGF0508F1-40X	CONNECTOR	40PIN
CN402	QGF0508F2-20X	CONNECTOR	20PIN
K401	PGZ00627Z	FERRATE BEADS	
K402	PGZ00627Z	FERRATE BEADS	

6.25 AUDIO/LCD BOARD ASSEMBLY PARTS LIST 3 2

SLK2091-I0C 3 2 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC201	NJM2068M-D-X	I.C.(M)	JRC
IC202	TC4W53F-X	I.C.(M)	TOSHIBA
IC203	TC4W53F-X	I.C.(M)	TOSHIBA
IC204	NJM2068M-D-X	I.C.(M)	JRC
IC205	NJM2068M-D-X	I.C.(M)	JRC
IC206	BA3314F-X	I.C.(M)	ROHM
IC207	BA3314F-X	I.C.(M)	ROHM
IC208	TC4051BF-X	I.C.(M)	TOSHIBA
IC209	TC4051BF-X	I.C.(M)	TOSHIBA
IC210	TC4S81F-X	I.C.(M)	TOSHIBA
IC211	TC4S81F-X	I.C.(M)	TOSHIBA
IC281	TC4W53F-X	I.C.(M)	TOSHIBA
IC282	NJM2904M-X	I.C.(M)	JRC
IC298	TC4S81F-X	I.C.(M)	TOSHIBA
IC299	TC4S81F-X	I.C.(M)	TOSHIBA
IC301	M5201FP-X	I.C.(M)	MITSUBISHI
IC302	M5201FP-X	I.C.(M)	MITSUBISHI
IC303	M5216FP-X	I.C.(M)	MITSUBISHI
IC304	M5218AFP-X	I.C.(M)	MITSUBISHI
IC601	UPD78P058BT	I.C.(M)	NEC
IC602	NJU6433FB2	I.C.(M)	JRC
IC603	TC7S66FU-X	I.C.(M)	TOSHIBA
IC604	TC7SU04FU-X	I.C.(M)	TOSHIBA
IC605	TC7W126FU-X	I.C.(M)	TOSHIBA
IC615	BA6138F-X	I.C.(M)	ROHM
IC616	S-80840ANNP-W	I.C.(M)	SEIKO
IC618	S-8423LFS-X	I.C.(M)	SEIKO
Q201	DTC124EUA-X	TRANSISTOR	ROHM
Q202	DTC124EUA-X	TRANSISTOR	ROHM
Q203	DTC144EUA-X	TRANSISTOR	ROHM
Q204	DTC144EUA-X	TRANSISTOR	ROHM
Q298	DTC144EUA-X	TRANSISTOR	ROHM
Q299	DTC144EUA-X	TRANSISTOR	ROHM
Q301	FMW3-X	TRANSISTOR	ROHM
Q302	2SD601A/QRS/-X	TRANSISTOR	MATSUSHITA
Q309	FMW3-X	TRANSISTOR	ROHM
Q310	DTC124EUA-X	TRANSISTOR	ROHM
Q311	2SJ279S-X	FET	HITACHI
Q321	DTC144EUA-X	TRANSISTOR	ROHM
Q322	DTA114EUA-X	TRANSISTOR	ROHM
Q361	DTC144EUA-X	TRANSISTOR	ROHM
Q601	DTA124EUA-X	TRANSISTOR	ROHM
Q602	DTC124EUA-X	TRANSISTOR	ROHM
Q603	FMC2A-X	TRANSISTOR	ROHM
Q604	FMC2A-X	TRANSISTOR	ROHM
Q605	FMC2A-X	TRANSISTOR	ROHM
Q606	FMC2A-X	TRANSISTOR	ROHM
Q607	DTC124EUA-X	TRANSISTOR	ROHM
D605	DAN202U-X	DIODE	ROHM
D606	DAN202U-X	DIODE	ROHM
D607	DAN202U-X	DIODE	ROHM
LD601	TLSG208	L.E.D.	
LD602	QLD0092-001	L.C.D	
PC201	P873-25	PHOTO COUPLER	
R201	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R202	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R203	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R204	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R205	NRSA63J-682X	M.G.RESISTOR	6.8k 1/16W
R206	NRSA63J-682X	M.G.RESISTOR	6.8k 1/16W
R207	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R208	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R209	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R210	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R211	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R212	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R215	NRSA63J-123X	M.G.RESISTOR	12k 1/16W
R216	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R217	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R218	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R219	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R220	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R221	NRSA63J-182X	M.G.RESISTOR	1.8k 1/16W
R222	NRSA63J-182X	M.G.RESISTOR	1.8k 1/16W
R223	NRSA63J-471X	M.G.RESISTOR	470 1/16W
R224	NRSA63J-471X	M.G.RESISTOR	470 1/16W
R225	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R226	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R227	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R228	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R230	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R235	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R236	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R237	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R239	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R240	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R241	NRSA63J-153X	M.G.RESISTOR	15k 1/16W
R242	NRSA63J-153X	M.G.RESISTOR	15k 1/16W
R243	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R244	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R245	NRSA63J-183X	M.G.RESISTOR	18k 1/16W
R246	NRSA63J-183X	M.G.RESISTOR	18k 1/16W
R247	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R248	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R249	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R250	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R251	NRSA63J-182X	M.G.RESISTOR	1.8k 1/16W
R252	NRSA63J-182X	M.G.RESISTOR	1.8k 1/16W
R253	NRSA63J-225X	M.G.RESISTOR	2.2M 1/16W
R254	NRSA63J-225X	M.G.RESISTOR	2.2M 1/16W
R255	NRSA63J-123X	M.G.RESISTOR	12k 1/16W
R256	NRSA63J-123X	M.G.RESISTOR	12k 1/16W
R257	NRSA63J-273X	M.G.RESISTOR	27k 1/16W
R258	NRSA63J-273X	M.G.RESISTOR	27k 1/16W
R259	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R260	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R261	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R262	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R263	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R264	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R267	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R268	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R269	NRSA63J-224X	M.G.RESISTOR	220k 1/16W
R270	NRSA63J-224X	M.G.RESISTOR	220k 1/16W
R271	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R281	NRSA63J-472X	M.G.RESISTOR	4.7k 1/16W
R282	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R283	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R284	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R298	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R299	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R301	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R302	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R303	NRSA63J-822X	M.G.RESISTOR	8.2k 1/16W
R304	NRSA63J-822X	M.G.RESISTOR	8.2k 1/16W
R305	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R306	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R307	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R308	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R309	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R310	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R311	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R312	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R313	NRSA63J-822X	M.G.RESISTOR	8.2k 1/16W
R314	NRSA63J-822X	M.G.RESISTOR	8.2k 1/16W
R315	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R316	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R317	NRSA63J-102X	M.G.RESISTOR	1k 1/16W

[AUDIO/LCD]

Symbol No.	Part No.	Part Name	Description	
R318	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R319	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R320	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R323	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R324	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R325	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R326	NRSA63J-273X	M.G.RESISTOR	27k	1/16W
R327	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R328	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R329	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R330	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R331	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R332	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R335	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R336	NRSA63J-202X	M.G.RESISTOR	2k	1/16W
R337	NRSA63J-202X	M.G.RESISTOR	2k	1/16W
R339	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R340	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R341	NRSA63J-330X	M.G.RESISTOR	33	1/16W
R342	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R343	NRSA63J-510X	M.G.RESISTOR	51	1/16W
R344	NRSA63J-510X	M.G.RESISTOR	51	1/16W
R345	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R355	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R356	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R358	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R359	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R361	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R362	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R371	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R372	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R373	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R374	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R375	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R376	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R377	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R380	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R381	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R383	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R385	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R390	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R391	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R392	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R393	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R394	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R395	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R396	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R398	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R601	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R602	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R603	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R604	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R605	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R606	NRSA63J-121X	M.G.RESISTOR	120	1/16W
R607	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R608	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R609	NRSA63J-334X	M.G.RESISTOR	330k	1/16W
R610	NRSA63J-821X	M.G.RESISTOR	820	1/16W
R611	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R612	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R630	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R631	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R632	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R633	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R634	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R635	NRSA63J-823X	M.G.RESISTOR	82k	1/16W
R636	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R637	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R638	NRSA63J-224X	M.G.RESISTOR	220k	1/16W
R639	NRSA63J-224X	M.G.RESISTOR	220k	1/16W
R640	NRSA63J-224X	M.G.RESISTOR	220k	1/16W
R641	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R642	NRSA63J-334X	M.G.RESISTOR	330k	1/16W
R643	NRSA63J-301X	M.G.RESISTOR	300	1/16W
R644	NRSA63J-301X	M.G.RESISTOR	300	1/16W
R645	NRSA63J-301X	M.G.RESISTOR	300	1/16W
R646	NRSA63J-301X	M.G.RESISTOR	300	1/16W
R647	NRSA63J-301X	M.G.RESISTOR	300	1/16W
R648	NRSA63J-301X	M.G.RESISTOR	300	1/16W
R649	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R650	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R651	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R652	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R653	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R654	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R655	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R656	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R657	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R658	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R659	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R660	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R661	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R662	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R663	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R664	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R665	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R666	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R667	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R668	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R669	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R670	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R671	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R672	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R673	NRSA63J-271X	M.G.RESISTOR	270	1/16W
R674	NRSA63J-271X	M.G.RESISTOR	270	1/16W
R675	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R676	NRSA63J-271X	M.G.RESISTOR	270	1/16W
R677	NRSA63J-154X	M.G.RESISTOR	150k	1/16W
R678	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R679	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R680	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R681	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R682	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R683	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R684	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R685	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R686	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R687	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R688	NRSA63J-154X	M.G.RESISTOR	150k	1/16W
R689	NRSA63J-154X	M.G.RESISTOR	150k	1/16W
R701	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R702	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R703	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R704	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R705	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R706	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R707	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R708	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R709	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R710	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R711	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R712	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R714	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R715	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R716	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R717	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R718	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R721	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R722	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R723	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R724	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R725	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R726	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R727	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R728	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R729	NRSA63J-102X	M.G.RESISTOR	1k	1/16W

Symbol No.	Part No.	Part Name	Description	
VR201	QVQ0290-A14	VAL.RESISTOR	10k	REC VR CH1
VR202	QVQ0290-A14	VAL.RESISTOR	10k	REC VR CH2
VR301	NVP1415-104X	TRIM.RESISTOR	100k	CH1 UNIT
VR302	NVP1415-104X	TRIM.RESISTOR	100k	
VR303	NVP1415-104X	TRIM.RESISTOR	100k	
VR304	NVP1415-104X	TRIM.RESISTOR	100k	CH2 UNIT
VR310	QVQ0290-A14	VAL.RESISTOR	10k	AU OUT SEL
VR311	QVQ0290-A14	VAL.RESISTOR	10k	ALARM/MON
VR601	NVP1415-502X	TRIM.RESISTOR	5k	LCD L LEV
VR602	NVP1415-502X	TRIM.RESISTOR	5k	LCD R LEV
C201	NCB41CM-106X	CER.CAPACITOR	10	16V
C202	NCB41CM-106X	CER.CAPACITOR	10	16V
C203	NCB41CM-106X	CER.CAPACITOR	10	16V
C204	NCB41CM-106X	CER.CAPACITOR	10	16V
C205	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C206	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C207	NEH71CM-106X	E.CAPACITOR	10	16V
C208	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C209	NEH71CM-106X	E.CAPACITOR	10	16V
C211	NCB41CM-106X	CER.CAPACITOR	10	16V
C212	NCB41CM-106X	CER.CAPACITOR	10	16V
C213	NCB21CK-474X	CER.CAPACITOR	0.47	16V
C214	NCB21CK-474X	CER.CAPACITOR	0.47	16V
C215	NCB21CK-474X	CER.CAPACITOR	0.47	16V
C216	NCB21CK-474X	CER.CAPACITOR	0.47	16V
C217	NEH71CM-476X	E.CAPACITOR	47	16V
C218	NEH71CM-476X	E.CAPACITOR	47	16V
C219	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C220	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C223	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C224	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C225	NCB41CM-106X	CER.CAPACITOR	10	16V
C226	NCB41CM-106X	CER.CAPACITOR	10	16V
C227	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C228	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C229	NEH71CM-106X	E.CAPACITOR	10	16V
C230	NEH71CM-106X	E.CAPACITOR	10	16V
C231	NEH71CM-106X	E.CAPACITOR	10	16V
C232	NEH71CM-106X	E.CAPACITOR	10	16V
C233	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C234	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C235	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C236	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C237	NEH71CM-106X	E.CAPACITOR	10	16V
C238	NEH71CM-106X	E.CAPACITOR	10	16V
C239	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C240	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C241	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C242	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C243	NEH71CM-106X	E.CAPACITOR	10	16V
C244	NEH71CM-106X	E.CAPACITOR	10	16V
C247	NEH71CM-106X	E.CAPACITOR	10	16V
C248	NEH71CM-106X	E.CAPACITOR	10	16V
C249	NEH71CM-106X	E.CAPACITOR	10	16V
C250	NEH71CM-106X	E.CAPACITOR	10	16V
C251	NCB41CM-106X	CER.CAPACITOR	10	16V
C252	NCB41CM-106X	CER.CAPACITOR	10	16V
C253	NCB41CM-106X	CER.CAPACITOR	10	16V
C254	NCB41CM-106X	CER.CAPACITOR	10	16V
C255	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C256	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C257	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C258	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C265	NEH71CM-106X	E.CAPACITOR	10	16V
C266	NEH71CM-106X	E.CAPACITOR	10	16V
C267	NCB41CM-106X	CER.CAPACITOR	10	16V
C268	NCB41CM-106X	CER.CAPACITOR	10	16V
C269	NCB41CM-106X	CER.CAPACITOR	10	16V
C270	NCB41CM-106X	CER.CAPACITOR	10	16V
C271	NEH71CM-106X	E.CAPACITOR	10	16V
C272	NEH71CM-106X	E.CAPACITOR	10	16V
C280	NCB31CK-104X	CER.CAPACITOR	0.1	16V

Symbol No.	Part No.	Part Name	Description	
C281	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C282	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C291	NCB41CM-106X	CER.CAPACITOR	10	16V
C292	NCB41CM-106X	CER.CAPACITOR	10	16V
C303	NCB41CM-106X	CER.CAPACITOR	10	16V
C304	NCB41CM-106X	CER.CAPACITOR	10	16V
C309	NCB41CM-106X	CER.CAPACITOR	10	16V
C310	NCB41CM-106X	CER.CAPACITOR	10	16V
C313	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C314	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C315	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C316	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C317	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C318	NEH71CM-226X	E.CAPACITOR	22	16V
C319	NEH71CM-226X	E.CAPACITOR	22	16V
C320	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C321	NEH71CM-226X	E.CAPACITOR	22	16V
C322	NEH71CM-226X	E.CAPACITOR	22	16V
C323	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C324	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C325	NCB41CM-106X	CER.CAPACITOR	10	16V
C326	NCB41CM-106X	CER.CAPACITOR	10	16V
C330	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C331	NEH71CM-226X	E.CAPACITOR	22	16V
C332	NEH71CM-226X	E.CAPACITOR	22	16V
C333	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C334	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C335	NEH71CM-226X	E.CAPACITOR	22	16V
C336	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C337	NEH71CM-226X	E.CAPACITOR	22	16V
C341	NCB41CM-106X	CER.CAPACITOR	10	16V
C342	NCB41CM-106X	CER.CAPACITOR	10	16V
C343	NCB41CM-106X	CER.CAPACITOR	10	16V
C346	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C347	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C349	NEH71CM-106X	E.CAPACITOR	10	16V
C353	NEH71CM-476X	E.CAPACITOR	47	16V
C354	NCB41CM-106X	CER.CAPACITOR	10	16V
C355	NCB41CM-106X	CER.CAPACITOR	10	16V
C356	NCB41CM-106X	CER.CAPACITOR	10	16V
C357	NEH71EM-226X	E.CAPACITOR	22	25V
C361	NCB41CM-106X	CER.CAPACITOR	10	16V
C362	NCB41CM-106X	CER.CAPACITOR	10	16V
C368	NEH71CM-106X	E.CAPACITOR	10	16V
C370	NEH71CM-106X	E.CAPACITOR	10	16V
C373	NCB41CM-106X	CER.CAPACITOR	10	16V
C374	NCB41CM-106X	CER.CAPACITOR	10	16V
C381	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C382	NEH71CM-476X	E.CAPACITOR	47	16V
C383	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C384	NEH71CM-476X	E.CAPACITOR	47	16V
C385	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C386	NEH71CM-476X	E.CAPACITOR	47	16V
C387	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C388	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C389	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C391	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C392	NEH71EM-226X	E.CAPACITOR	22	25V
C393	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C601	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C602	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C603	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C604	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C619	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C620	NCB41EM-475X	CER.CAPACITOR	4.7	25V
C621	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C622	NCB41CM-106X	CER.CAPACITOR	10	16V
C623	NCB41CM-106X	CER.CAPACITOR	10	16V
C624	NCF21CZ-105X	CER.CAPACITOR	1	16V
C625	NCB41EM-475X	CER.CAPACITOR	4.7	25V
C628	NCB41CM-106X	CER.CAPACITOR	10	16V
C629	NCB41CM-106X	CER.CAPACITOR	10	16V
C630	NCB41CM-106X	CER.CAPACITOR	10	16V

[AUDIO/LCD]

Symbol No.	Part No.	Part Name	Description
C631	NCB41EM-475X	CER.CAPACITOR	4.7 25V
C633	NCB41EM-475X	CER.CAPACITOR	4.7 25V
C634	NCB41EM-475X	CER.CAPACITOR	4.7 25V
C635	NDC31HJ-180X	CER.CAPACITOR	18p 50V
C636	NDC31HJ-150X	CER.CAPACITOR	15p 50V
C637	NDC31HJ-150X	CER.CAPACITOR	15p 50V
C638	NDC31HJ-150X	CER.CAPACITOR	15p 50V
C639	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C640	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C641	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C642	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C643	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C651	NCB41EM-475X	CER.CAPACITOR	4.7 25V
C652	NCB41EM-475X	CER.CAPACITOR	4.7 25V
C653	NCB41CM-106X	CER.CAPACITOR	10 16V
C654	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C655	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C656	NCB41CM-106X	CER.CAPACITOR	10 16V
C657	NCB41EM-475X	CER.CAPACITOR	4.7 25V
C670	NCB41CM-106X	CER.CAPACITOR	10 16V
C671	NCB41CM-106X	CER.CAPACITOR	10 16V
L381	NQL024J-100X	COIL	10uH
L382	NQL024J-100X	COIL	10uH
L383	NQL024J-100X	COIL	10uH
L384	NQL024J-100X	COIL	10uH
L602	NQL024J-100X	COIL	10uH
L603	NQL024J-100X	COIL	10uH
L604	NQL024J-100X	COIL	10uH
L605	NQL024J-100X	COIL	10uH
X601	NAX0065-001X	CRYSTAL	4.912MHz
X602	NAX0074-001X	CRYSTAL	32.768kHz
S201	NSW0070-001X	SLIDE SWITCH	INPUT SEL CH1
S202	NSW0070-001X	SLIDE SWITCH	INPUT SEL CH2
S203	NSW0070-001X	SLIDE SWITCH	MANU/AUTO CH1
S204	NSW0070-001X	SLIDE SWITCH	MANU/AUTO CH2
S301	QSW0340-001	SLIDE SWITCH	AUDIO OUT SEL
S601	NSW0070-001X	SLIDE SWITCH	PRESET/REGEN.
S602	NSW0070-001X	SLIDE SWITCH	FREE/REC
S603	QSW0334-001	SLIDE SWITCH	LIGHT
S604	NSW0005-001X	SWITCH	CONTINUE
S605	NSW0005-001X	SWITCH	MENU
S606	NSW0005-001X	SWITCH	HOLD
S607	NSW0005-001X	SWITCH	SHIFT
S608	NSW0005-001X	SWITCH	ADVANCE
S609	NSW0005-001X	SWITCH	PRESET
S610	NSW0005-001X	SWITCH	RESET
S611	QSW0340-001	SLIDE SWITCH	CTL/TC/UB
S612	NSW0125-001X	SWITCH	
CN201	QGF0508F1-40X	CONNECTOR	40PIN
CN202	QGA1201F2-04X	CONNECTOR	4PIN
CN203	QGA1201F2-02X	CONNECTOR	2PIN
CN601	QGF0508F1-30X	CONNECTOR	30PIN
CN602	QGF1012F1-08X	CONNECTOR	8PIN
CN604	QGF0508F1-20X	CONNECTOR	20PIN
BT601	CR2032-HLD	BATTERY HOLDER	
⚠CP601	ICP-S1.0TN	ICP	
DI601	QLL0063-001	BACK LIGHT ASSY	
K603	PGZ00627Z	FERRATE BEADS	
K604	PGZ00627Z	FERRATE BEADS	
K605	PGZ00627Z	FERRATE BEADS	
K606	PGZ00627Z	FERRATE BEADS	
K607	PGZ00627Z	FERRATE BEADS	

6.26 REG BOARD ASSEMBLY PARTS LIST 3 3

SLK2095-00B 3 3 ☐ ☐ ☐ ☐ ☐ ☐

Symbol No.	Part No.	Part Name	Description
IC1	MB3782PF-X	I.C.(M)	FUJITSU
IC2	MB3782PF-X	I.C.(M)	FUJITSU
Q1	2SJ484WY-X	FET	HITACHI
Q2	2SC4097/QR/-X	TRANSISTOR	ROHM
Q3	2SA1577/QR/-X	TRANSISTOR	ROHM
Q4	2SJ484WY-X	FET	HITACHI
Q5	2SC4097/QR/-X	TRANSISTOR	ROHM
Q6	2SA1577/QR/-X	TRANSISTOR	ROHM
Q7	2SJ484WY-X	FET	HITACHI
Q8	2SC4097/QR/-X	TRANSISTOR	ROHM
Q9	2SA1577/QR/-X	TRANSISTOR	ROHM
Q10	2SJ484WY-X	FET	HITACHI
Q11	2SC4097/QR/-X	TRANSISTOR	ROHM
Q12	2SA1577/QR/-X	TRANSISTOR	ROHM
Q13	2SA1577/QR/-X	TRANSISTOR	ROHM
Q14	2SC4097/QR/-X	TRANSISTOR	ROHM
Q15	HAT1021R-X	TRANSISTOR	HITACHI
Q16	2SC4097/QR/-X	TRANSISTOR	ROHM
Q17	2SA1577/QR/-X	TRANSISTOR	ROHM
Q18	2SA1312/G/-X	TRANSISTOR	TOSHIBA
Q19	DTC144EUA-X	TRANSISTOR	ROHM
D1	MA736-X	DIODE	MATSUSHITA
D2	MA736-X	DIODE	MATSUSHITA
D3	MA736-X	DIODE	MATSUSHITA
D4	MA736-X	DIODE	MATSUSHITA
D5	DA114-X	DIODE	ROHM
D6	DA114-X	DIODE	ROHM
D9	MA738-X	DIODE	MATSUSHITA
R1	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R2	NRSA63D-471X	M.G.RESISTOR	470 1/16W
R3	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R4	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R5	NRSA63D-471X	M.G.RESISTOR	470 1/16W
R6	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R7	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R8	NRSA63D-471X	M.G.RESISTOR	470 1/16W
R9	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R10	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R11	NRSA63D-471X	M.G.RESISTOR	470 1/16W
R12	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R13	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R14	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R15	NRSA63D-681X	M.G.RESISTOR	680 1/16W
R16	NRSA63D-473X	M.G.RESISTOR	47k 1/16W
R17	NRSA63D-332X	M.G.RESISTOR	3.3k 1/16W
R18	NRSA63D-471X	M.G.RESISTOR	470 1/16W
R19	NRSA63D-100X	M.G.RESISTOR	10 1/16W
R20	NRSA63D-153X	M.G.RESISTOR	15k 1/16W
R21	NRSA63D-154X	M.G.RESISTOR	150k 1/16W
R22	NRSA63D-222X	M.G.RESISTOR	2.2k 1/16W
R23	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R24	NRSA63D-683X	M.G.RESISTOR	68k 1/16W
R25	NRSA63D-274X	M.G.RESISTOR	270k 1/16W
R26	NRSA63D-472X	M.G.RESISTOR	4.7k 1/16W
R27	NRSA63D-154X	M.G.RESISTOR	150k 1/16W
R28	NRSA63D-472X	M.G.RESISTOR	4.7k 1/16W
R29	NRSA63D-154X	M.G.RESISTOR	150k 1/16W
R30	NRSA63D-683X	M.G.RESISTOR	68k 1/16W
R31	NRSA63D-274X	M.G.RESISTOR	270k 1/16W
R32	NRSA63D-105X	M.G.RESISTOR	1M 1/16W
R33	NRSA63D-822X	M.G.RESISTOR	8.2k 1/16W
R34	NRSA63D-222X	M.G.RESISTOR	2.2k 1/16W
R35	NRSA63D-472X	M.G.RESISTOR	4.7k 1/16W
R36	NRSA63D-822X	M.G.RESISTOR	8.2k 1/16W
R37	NRSA63D-154X	M.G.RESISTOR	150k 1/16W
R38	NRSA63D-472X	M.G.RESISTOR	4.7k 1/16W
R39	NRSA63D-472X	M.G.RESISTOR	4.7k 1/16W
R40	NRSA63D-683X	M.G.RESISTOR	68k 1/16W
R41	NRSA63D-274X	M.G.RESISTOR	270k 1/16W

Symbol No.	Part No.	Part Name	Description	
R42	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R43	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
R44	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R46	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R47	NRSA63D-224X	M.G.RESISTOR	220k	1/16W
R48	NRSA63D-682X	M.G.RESISTOR	6.8k	1/16W
R49	NRSA63D-102X	M.G.RESISTOR	1k	1/16W
R50	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R51	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R52	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R53	NRSA63D-154X	M.G.RESISTOR	150k	1/16W
R54	NRSA63D-683X	M.G.RESISTOR	68k	1/16W
R55	NRSA63D-274X	M.G.RESISTOR	270k	1/16W
R56	NRSA63D-683X	M.G.RESISTOR	68k	1/16W
R57	NRSA63D-274X	M.G.RESISTOR	270k	1/16W
R58	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R59	NRSA63D-154X	M.G.RESISTOR	150k	1/16W
R60	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R61	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R62	NRSA63D-154X	M.G.RESISTOR	150k	1/16W
R63	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R64	NRSA63D-683X	M.G.RESISTOR	68k	1/16W
R65	NRSA63D-154X	M.G.RESISTOR	150k	1/16W
R66	NRSA63D-222X	M.G.RESISTOR	2.2k	1/16W
R67	NRSA63D-823X	M.G.RESISTOR	82k	1/16W
R68	NRSA63D-392X	M.G.RESISTOR	3.9k	1/16W
R69	NRSA63D-472X	M.G.RESISTOR	4.7k	1/16W
R70	NRSA63D-103X	M.G.RESISTOR	10k	1/16W
R71	NRSA63D-823X	M.G.RESISTOR	82k	1/16W
R72	NRSA63D-681X	M.G.RESISTOR	680	1/16W
R101	NRSA63D-274X	M.G.RESISTOR	270k	1/16W
R102	NRSA63D-273X	M.G.RESISTOR	27k	1/16W
C1	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C2	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C3	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C4	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C5	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C6	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C7	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C8	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C9	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C10	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C11	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C12	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C13	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C14	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C15	NEHE1JM-106X	E.CAPACITOR	10	63V
C16	NCF21HZ-104X	CER.CAPACITOR	0.1	50V
C17	NCF21HZ-104X	CER.CAPACITOR	0.1	50V
C18	NCF21HZ-104X	CER.CAPACITOR	0.1	50V
C19	NCF21HZ-104X	CER.CAPACITOR	0.1	50V
C20	NCS31HJ-471X	CER.CAPACITOR	470p	50V
C21	NCS31HJ-471X	CER.CAPACITOR	470p	50V
C22	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C23	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C24	NBQD1AM-686X	TAN.CAPACITOR	68	10V
C25	NEH71EM-226X	E:CAPACITOR	22	25V
C26	NEH71EM-226X	E.CAPACITOR	22	25V
C27	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C28	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C29	NCB31EK-822X	CER.CAPACITOR	8200p	25V
C30	NCB31EK-822X	CER.CAPACITOR	8200p	25V
C31	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C32	NCS31HJ-391X	CER.CAPACITOR	390p	50V
C33	NCB31EK-822X	CER.CAPACITOR	8200p	25V
C34	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C35	NCB11CK-105X	CER.CAPACITOR	1	16V
C36	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C37	NCB31EK-822X	CER.CAPACITOR	8200p	25V
C38	NCB31EK-822X	CER.CAPACITOR	8200p	25V
C39	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C40	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C41	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C42	NCB31EK-822X	CER.CAPACITOR	8200p	25V
C43	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C44	NCB41EM-475X	CER.CAPACITOR	4.7	25V
C45	NCB41EM-475X	CER.CAPACITOR	4.7	25V
C46	NCB41EM-475X	CER.CAPACITOR	4.7	25V
C47	NCB41EM-475X	CER.CAPACITOR	4.7	25V
C48	NCB31CK-104X	CER.CAPACITOR	0.1	16V
C61	NEHE1JM-106X	E.CAPACITOR	10	63V
C101	NCB31CK-104X	CER.CAPACITOR	0.1	16V
L1	SSV2810-330V	COIL	33uH	
L2	SSV2810-330V	COIL	33uH	
L3	SSV2810-330V	COIL	33uH	
L4	SSV2810-330V	COIL	33uH	
L5	SSV2810-330V	COIL	33uH	
L6	SSV2810-330V	COIL	33uH	
L7	SSV2810-330V	COIL	33uH	
L8	SSV2810-330V	COIL	33uH	
L9	SSV2810-330V	COIL	33uH	
L10	NQL42EM-220X	COIL	22uH	
L11	NQL26CM-220X	COIL	22uH	
L20	SSV2810-330V	COIL	33uH	
L21	NQL26CM-330X	COIL	33uH	
CN1	QGA1201F2-06X	CONNECTOR	6PIN	
CN2	QGA1201C2-12X	CONNECTOR	12PIN	
CN3	QGA1201C2-04X	CONNECTOR	4PIN	
⚠CP1	ICP-S0.5TN	ICP		
⚠CP2	ICP-S2.3TN	ICP		
⚠CP3	ICP-S2.3TN	ICP		
T1	NQR0183-001X	TRANSFORMER		

6.27 MOTHER BOARD ASSEMBLY PARTS LIST 34

SLK2098-01-00A 34☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
CN3	QGF0508C1-33W	CONNECTOR	33PIN
CN4	QGF0508C1-30W	CONNECTOR	30PIN
CN101	QGF0508C1-40W	CONNECTOR	40PIN
CN102	SCV2477-006	CONNECTOR	6PIN
CN103	SCV2477-016	CONNECTOR	16PIN
CN104	QGF0508C1-20W	CONNECTOR	20PIN
CN105	QGA1201C2-07X	CONNECTOR	7PIN
CN106	QGA1201C2-12X	CONNECTOR	12PIN
CN115	QGA1201C2-05X	CONNECTOR	5PIN
CN201	QGF0508C1-40W	CONNECTOR	40PIN
CN401	QGF0508C1-40W	CONNECTOR	40PIN
CN601	QGF0508C1-30W	CONNECTOR	30PIN

6.28 OPE BOARD ASSEMBLY PARTS LIST 35

SLK2098-02-00A 35☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	M66312FP-W	I.C.(M)	MITSUBISHI
IC2	TC7S14FU-X	I.C.(M)	TOSHIBA
IC3	TC7S14FU-X	I.C.(M)	TOSHIBA
D1	DAN202U-X	DIODE	ROHM
LD1	SLM-13VWF-X	L.E.D.	LOG
LD2	SLM-13VWF-X	L.E.D.	REW
LD3	SLM-13VWF-X	L.E.D.	FF
LD4	SLM-13VWF-X	L.E.D.	PLAY
LD5	SLM-13VWF-X	L.E.D.	STILL
R1	NRSA63J-472X	M.G.RESISTOR	4.7k 1/16W
R2	NRSA63J-472X	M.G.RESISTOR	4.7k 1/16W
R3	NRSA63J-472X	M.G.RESISTOR	4.7k 1/16W
R4	NRSA63J-472X	M.G.RESISTOR	4.7k 1/16W
R5	NRSA63J-224X	M.G.RESISTOR	220k 1/16W
R6	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R7	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R8	NRSA63J-122X	M.G.RESISTOR	1.2k 1/16W
R9	NRSA63J-222X	M.G.RESISTOR	2.2k 1/16W
R10	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R11	NRSA63J-561X	M.G.RESISTOR	560 1/16W
R12	NRSA63J-561X	M.G.RESISTOR	560 1/16W
R14	NRSA63J-561X	M.G.RESISTOR	560 1/16W
R15	NRSA63J-561X	M.G.RESISTOR	560 1/16W
R16	NRSA63J-561X	M.G.RESISTOR	560 1/16W
R17	NRSA63J-472X	M.G.RESISTOR	4.7k 1/16W
R18	NRSA63J-472X	M.G.RESISTOR	4.7k 1/16W
C1	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C2	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C3	NCB11CK-105X	CER.CAPACITOR	1 16V
C4	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C5	NCB31CK-104X	CER.CAPACITOR	0.1 16V
L1	NQL114K-100X	COIL	10uH
S1	NSW0005-001X	SWITCH	REW
S2	NSW0005-001X	SWITCH	STOP
S3	NSW0005-001X	SWITCH	FF
S4	NSW0005-001X	SWITCH	PLAY
S5	NSW0005-001X	SWITCH	STILL
S10	NSW0005-001X	SWITCH	LOG
CN1	QGF1013F1-08X	CONNECTOR	8PIN

6.29 SEN1 BOARD ASSEMBLY PARTS LIST 36

SLK2098-03-00A 36☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
PC1	TLP909	PHOTO COUPLER	
PC2	TLP830	PHOTO COUPLER	
R1	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R2	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R3	NRSA63J-821X	M.G.RESISTOR	820 1/16W
R4	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
C1	NCB31HK-103X	CER.CAPACITOR	0.01 50V
CN115	QGA1201F2-05X	CONNECTOR	5PIN
CN116	QGA1201F2-03X	CONNECTOR	3PIN

6.30 SENS2 BOARD ASSEMBLY PARTS LIST 37

SLK2098-04-00A 37☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
PC1	TLP814	PHOTO COUPLER	
R1	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R2	NRSA63J-821X	M.G.RESISTOR	820 1/16W
C1	NCB31HK-103X	CER.CAPACITOR	0.01 50V
CN116	QGA1201F2-03X	CONNECTOR	3PIN

6.31 REMOTE BOARD ASSEMBLY PARTS LIST 38

SLK2098-05-00C 38☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
D1	HZM9C-X	ZENER DIODE	HITACHI
D2	HZM9C-X	ZENER DIODE	HITACHI
D3	HZM9C-X	ZENER DIODE	HITACHI
D4	HZM9C-X	ZENER DIODE	HITACHI
D5	HZM9C-X	ZENER DIODE	HITACHI
D6	HZM9C-X	ZENER DIODE	HITACHI
CN102	SCV2477-006	CONNECTOR	6PIN
K1	SCV2662-027	FERRITE BEADS	
K2	SCV2662-027	FERRITE BEADS	
K3	SCV2662-027	FERRITE BEADS	
K4	SCV2662-027	FERRITE BEADS	
K5	SCV2662-027	FERRITE BEADS	

6.32 AU JUNK BOARD ASSEMBLY PARTS LIST 3 9

SLK2094-01-00B 3 9 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	NJM2068M-D-X	I.C.(M)	JRC
IC2	NJM2068M-D-X	I.C.(M)	JRC
IC101	NJM2068M-D-X	I.C.(M)	JRC
IC102	NJM2068M-D-X	I.C.(M)	JRC
Q51	2SD2240/RST/-X	TRANSISTOR	MATSUSHITA
Q52	2SB1463/RST/-X	TRANSISTOR	MATSUSHITA
Q53	2SD2240/RST/-X	TRANSISTOR	MATSUSHITA
Q151	2SD2240/RST/-X	TRANSISTOR	MATSUSHITA
Q152	2SB1463/RST/-X	TRANSISTOR	MATSUSHITA
Q153	2SD2240/RST/-X	TRANSISTOR	MATSUSHITA
D1	DA204U-X	DIODE	ROHM
D2	DA204U-X	DIODE	ROHM
D101	DA204U-X	DIODE	ROHM
D102	DA204U-X	DIODE	ROHM
R1	NRVA02D-222X	C.M.F.RESISTOR	2.2k 1/10W
R2	NRVA02D-222X	C.M.F.RESISTOR	2.2k 1/10W
R3	NRVA02D-222X	C.M.F.RESISTOR	2.2k 1/10W
R4	NRVA02D-222X	C.M.F.RESISTOR	2.2k 1/10W
R5	NRVA02D-182X	C.M.F.RESISTOR	1.8k 1/10W
R6	NRVA02D-182X	C.M.F.RESISTOR	1.8k 1/10W
R11	NRVA02D-331X	C.M.F.RESISTOR	330 1/10W
R12	NRVA02D-331X	C.M.F.RESISTOR	330 1/10W
R13	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R14	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R15	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R16	NRSA63J-222X	M.G.RESISTOR	2.2k 1/16W
R17	NRSA63J-222X	M.G.RESISTOR	2.2k 1/16W
R18	NRSA63J-750X	M.G.RESISTOR	75 1/16W
R19	NRSA63J-680X	M.G.RESISTOR	68 1/16W
R20	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R21	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R22	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R23	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R24	NRVA02D-153X	C.M.F.RESISTOR	15k 1/10W
R25	NRVA02D-153X	C.M.F.RESISTOR	15k 1/10W
R26	NRVA02D-153X	C.M.F.RESISTOR	15k 1/10W
R27	NRVA02D-153X	C.M.F.RESISTOR	15k 1/10W
R51	NRSA63J-273X	M.G.RESISTOR	27k 1/16W
R52	NRSA63J-274X	M.G.RESISTOR	270k 1/16W
R53	NRSA63J-274X	M.G.RESISTOR	270k 1/16W
R54	NRSA63J-105X	M.G.RESISTOR	1M 1/16W
R55	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R56	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R57	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R58	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R59	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R101	NRVA02D-222X	C.M.F.RESISTOR	2.2k 1/10W
R102	NRVA02D-222X	C.M.F.RESISTOR	2.2k 1/10W
R103	NRVA02D-222X	C.M.F.RESISTOR	2.2k 1/10W
R104	NRVA02D-222X	C.M.F.RESISTOR	2.2k 1/10W
R105	NRVA02D-182X	C.M.F.RESISTOR	1.8k 1/10W
R106	NRVA02D-182X	C.M.F.RESISTOR	1.8k 1/10W
R111	NRVA02D-331X	C.M.F.RESISTOR	330 1/10W
R112	NRVA02D-331X	C.M.F.RESISTOR	330 1/10W
R113	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R114	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R115	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R116	NRSA63J-222X	M.G.RESISTOR	2.2k 1/16W
R117	NRSA63J-222X	M.G.RESISTOR	2.2k 1/16W
R118	NRSA63J-750X	M.G.RESISTOR	75 1/16W
R119	NRSA63J-680X	M.G.RESISTOR	68 1/16W
R120	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R121	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R122	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R123	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R124	NRVA02D-153X	C.M.F.RESISTOR	15k 1/10W
R125	NRVA02D-153X	C.M.F.RESISTOR	15k 1/10W
R126	NRVA02D-153X	C.M.F.RESISTOR	15k 1/10W
R127	NRVA02D-153X	C.M.F.RESISTOR	15k 1/10W
R151	NRSA63J-273X	M.G.RESISTOR	27k 1/16W
R152	NRSA63J-274X	M.G.RESISTOR	270k 1/16W
R153	NRSA63J-274X	M.G.RESISTOR	270k 1/16W
R154	NRSA63J-105X	M.G.RESISTOR	1M 1/16W
R155	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R156	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R157	NRSA63J-473X	M.G.RESISTOR	47k 1/16W
R158	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R159	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R201	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R601	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R602	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R603	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R604	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
C1	NCB31HK-222X	CER.CAPACITOR	2200p 50V
C12	NEH71HM-106X	E.CAPACITOR	10 50V
C13	NEH71HM-106X	E.CAPACITOR	10 50V
C14	NEH71HM-106X	E.CAPACITOR	10 50V
C15	NEH71HM-106X	E.CAPACITOR	10 50V
C16	NDC31HJ-101X	CER.CAPACITOR	100p 50V
C17	NDC31HJ-101X	CER.CAPACITOR	100p 50V
C18	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C19	NEH71CM-476X	E.CAPACITOR	47 16V
C20	NEH71CM-476X	E.CAPACITOR	47 16V
C21	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C22	NDC31HJ-101X	CER.CAPACITOR	100p 50V
C23	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C24	NEH71CM-476X	E.CAPACITOR	47 16V
C25	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C26	NEH71CM-476X	E.CAPACITOR	47 16V
C27	NCB41CM-106X	CER.CAPACITOR	10 16V
C51	NEH71HM-105X	E.CAPACITOR	1 50V
C52	NEH71HM-105X	E.CAPACITOR	1 50V
C55	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C101	NCB31HK-222X	CER.CAPACITOR	2200p 50V
C112	NEH71HM-106X	E.CAPACITOR	10 50V
C113	NEH71HM-106X	E.CAPACITOR	10 50V
C114	NEH71HM-106X	E.CAPACITOR	10 50V
C115	NEH71HM-106X	E.CAPACITOR	10 50V
C116	NDC31HJ-101X	CER.CAPACITOR	100p 50V
C117	NDC31HJ-101X	CER.CAPACITOR	100p 50V
C118	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C119	NEH71CM-476X	E.CAPACITOR	47 16V
C120	NEH71CM-476X	E.CAPACITOR	47 16V
C121	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C122	NDC31HJ-101X	CER.CAPACITOR	100p 50V
C123	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C124	NEH71CM-476X	E.CAPACITOR	47 16V
C125	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C126	NEH71CM-476X	E.CAPACITOR	47 16V
C127	NCB41CM-106X	CER.CAPACITOR	10 16V
C151	NEH71HM-105X	E.CAPACITOR	1 50V
C152	NEH71HM-105X	E.CAPACITOR	1 50V
C155	NCB31HK-102X	CER.CAPACITOR	1000p 50V
C202	NEH71CM-476X	E.CAPACITOR	47 16V
C203	NCB31CK-104X	CER.CAPACITOR	0.1 16V
C205	NEH71CM-476X	E.CAPACITOR	47 16V
C206	NCB31CK-104X	CER.CAPACITOR	0.1 16V
L201	NQL024J-100X	COIL	10uH
L202	NQL024J-100X	COIL	10uH
S1	QSW0811-001	SLIDE SWITCH	INPUT SELECT 1
S101	QSW0811-001	SLIDE SWITCH	INPUT SELECT 2
CN104	QGF0508F1-20X	CONNECTOR	20PIN
CN107	SCV2477-010	CONNECTOR	10PIN
CN108	QGA1201C2-04X	CONNECTOR	4PIN
CN109	QGA1201C2-02X	CONNECTOR	2PIN
CN801	QGA1201C2-06X	CONNECTOR	6PIN
JK601	QNZ0097-001	JACK	DV
K601	SCV2662-027	FERRITE BEADS	
K602	SCV2662-027	FERRITE BEADS	

6.33 XLR BOARD ASSEMBLY PARTS LIST 4 0

SLK2094-02-00A 4 0 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
R301	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R302	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
C309	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C310	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C311	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C312	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C313	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C314	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C315	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C316	NDC31HJ-221X	CER.CAPACITOR	220p 50V
L301	NQL024J-101X	COIL	100uH
L302	NQL024J-101X	COIL	100uH
L303	NQL024J-101X	COIL	100uH
L304	NQL024J-101X	COIL	100uH
CN107	SCV2644-110W	CONNECTOR	11PIN
JK301	QNZ0428-001	CONNECTOR	AUDIO CH1
JK302	QNZ0428-001	CONNECTOR	AUDIO CH2
K301	SCV2662-027	FERRITE BEADS	
K302	SCV2662-027	FERRITE BEADS	
K303	SCV2662-027	FERRITE BEADS	
K304	SCV2662-027	FERRITE BEADS	
K305	SCV2662-027	FERRITE BEADS	
K306	SCV2662-027	FERRITE BEADS	

6.34 PWR JUNC BOARD ASSEMBLY PARTS LIST 4 1

SLK2093-01-00A 4 1 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
D1	SB140L-6395	DIODE	SANYO
D2	HZM9C-X	ZENER DIODE	HITACHI
C1	QEUA1EM-478	E.CAPACITOR	4700 25V
C2	NCB21EK-104X	CER.CAPACITOR	0.1 25V
C3	NCB21EK-104X	CER.CAPACITOR	0.1 25V
TH2	QAD0115-R40Z	THERMISTOR	0.4
⚠BK1	QMH0015-010	BLAKER	
CN41	QGA2001C1-05	CONNECTOR	5PIN
CN105	QGA1501C1-07	CONNECTOR	7PIN
CN110	QGA1501C1-06	CONNECTOR	6PIN
CN111	QGA2001C1-02	CONNECTOR	2PIN
CN112	QGA1501C1-02	CONNECTOR	2PIN
CN113	QGA3901C1-02	CONNECTOR	2PIN
CN114	QGA3901C1-04	CONNECTOR	4PIN
K1	SCV2662-027	FERRITE BEADS	
K2	SCV2662-027	FERRITE BEADS	
TB1	SQMX002-001Z	TERMINAL	

6.35 CONNECT BOARD ASSEMBLY PARTS LIST 4 2

SLK2093-02-00A 4 2 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
D1	HZM3.0NB1-X	ZENER DIODE	HITACHI
D2	HZM3.0NB1-X	ZENER DIODE	HITACHI
D3	HZM3.0NB1-X	ZENER DIODE	HITACHI
D4	HZM3.0NB1-X	ZENER DIODE	HITACHI
D5	HZM3.0NB1-X	ZENER DIODE	HITACHI
D6	HZM3.0NB1-X	ZENER DIODE	HITACHI
D7	HZM12NB2-X	ZENER DIODE	HITACHI
D8	HZM12NB2-X	ZENER DIODE	HITACHI
D9	HZM12NB2-X	ZENER DIODE	HITACHI
D10	HZM12NB2-X	ZENER DIODE	HITACHI
R1	NRSA02J-680X	M.G.RESISTOR	68 1/10W
R2	NRSA02J-680X	M.G.RESISTOR	68 1/10W
R3	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R4	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R5	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R6	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R7	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R8	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R9	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R10	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R15	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
C1	QEUC0JM-108Z	E.CAPACITOR	1000 6.3V
C2	QEUC0JM-108Z	E.CAPACITOR	1000 6.3V
C3	NDC21HJ-561X	CER.CAPACITOR	560p 50V
C5	NDC21HJ-561X	CER.CAPACITOR	560p 50V
L1	NQL024J-4R7X	COIL	4.7uH
L2	NQL024J-4R7X	COIL	4.7uH
CN103	QGF1003C1-16	CONNECTOR	16PIN
JK1	QNZ0157-001	JACK	Y/C BNC
JK4	QNN0251-001	JACK	PIN

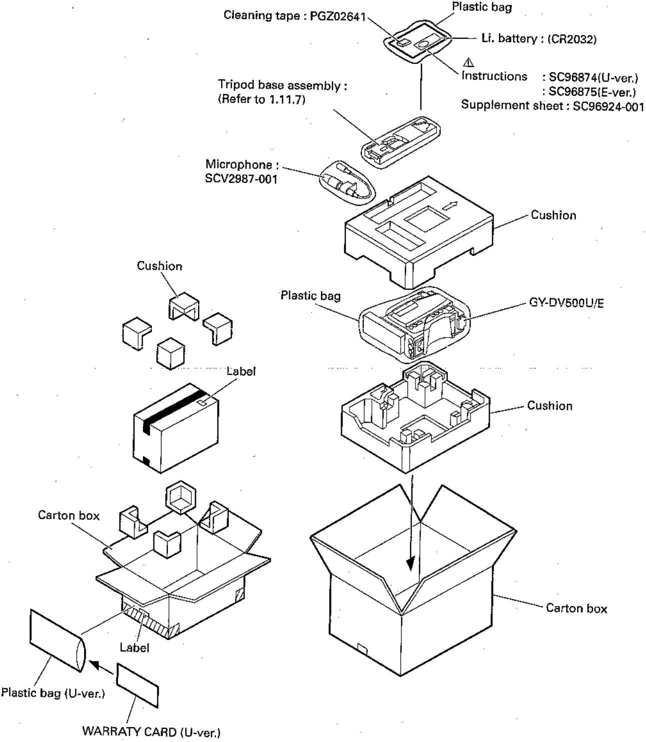
6.36 EAR.J BOARD ASSEMBLY PARTS LIST 4 3

SLK2093-03-00A 4 3 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
C401	NDC21HJ-221X	CER.CAPACITOR	220p 50V
C402	NDC21HJ-221X	CER.CAPACITOR	220p 50V
C403	NDC21HJ-221X	CER.CAPACITOR	220p 50V
C404	NDC21HJ-221X	CER.CAPACITOR	220p 50V
L401	NQL024J-4R7X	COIL	4.7uH
L402	NQL024J-4R7X	COIL	4.7uH
L403	NQL024J-4R7X	COIL	4.7uH
CN108	QGA1501C1-04	CONNECTOR	4PIN
JK401	QNS0153-001	JACK	EARPHONE

SECTION 7
PACKING

7.1 PACKING ASSEMBLY M 7



Cleaning tape : PGZ02641
Plastic bag
Li. battery : (CR2032)
⚠
Instructions : SC96874(U-ver.)
: SC96875(E-ver.)
Supplement sheet : SC96924-001
Tripod base assembly :
(Refer to 1.11.7)
Microphone :
SCV2987-001
Cushion
Cushion
Plastic bag
GY-DV500U/E
Label
Cushion
Carton box
Carton box
Label
Plastic bag (U-ver.)
WARRATY CARD (U-ver.)

7.2 FACTORY SETTING OF SWITCH AND VR

☐: Factory setting

SW and VR name	Factory setting		
AUDIO LEVEL VR	CENTER		
ZEBRA	[✓ ON]	OFF	SKIN AREA
FILTER	[✓ 3200K]	5600K	5600 K+ND
POWER SW	ON	[✓ OFF]	
VTR	SAVE	[✓ STBY]	
GAIN	H	M	[✓ L]
OUTPUT	BARS	CAM/AUTO KNEE OFF	[✓ CAM/AUTO KNEE ON]
WHT. BAL	PRST	[✓ A]	B
AUTO IRIS	BACK L	[✓ NORMAL]	SPOT L
BLACK	STRETCH	[✓ NORMAL]	COMPRESS
ALARM VR	CENTER		
MONITOR VR	CENTER		
MONITOR SELECT	CH-1	[✓ MIX]	CH-2
LIGHT	[✓ ON]	OFF	
COUNTER	CTL	[✓ TC]	UB
TC GENERATOR	[✓ PRESET]	REGEN	
	[✓ FREE]	REC	
AUDIO LEVEL CH-1/CH-2	CENTER		
AUDIO SELECT CH-1/CH-2	[✓ AUTO]	MANUAL	
AUDIO INPUT CH-1/CH-2	[✓ FRONT]	REAR	
AUDIO IN CH-1/CH-2	[✓ LINE]	MIC	MIC +48V ON

SECTION 8
DESCRIPTION OF NEW CIRCUITRY

8.1 OUTLINE OF DV

8.1.1 Features of DV

Table 8-1-1 outlines comparisons between DV and other digital VCR formats.

			D9 (Digital S)	DVC Pro	DV CAM	DV
Tape	Material		MP		ME	
	Width (inch)		1/2	1/4		
	Track pitch (µm)		20	18	15	10
Video	Sampling frequency (MHz)	Y	13.5			
		R-Y/B-Y	6.75		3.375	
	Sampling rate	NTSC	4 : 2 : 2	4 : 1 : 1		
		PAL		4 : 2 : 0 (Line Sequential)		
	Samples per line	Y	720			
		R-Y/B-Y	360	180 : NTSC,360 : PAL		
	TV lines per frame	NTSC	482	480		
		PAL	578	576 : Y , 288 : R-Y/B-Y		
	Quantization bits		8			
	Compression method		In-frame DCT			
	Compression		1/3.3	1/5		
Audio	Sampling frequency (kHz)		48	48(32)		
	Quantization bits		16	16(12)		
	Channels		4	2(4)		
	Compression		Non compressed			
Error correction code			Reed-Solomon integration code			
Modulation method			SI-NRZI, 24/25			

Table 8-1-1 Comparison of Digital VCR Formats

As shown in the above table, the major specifications of the DV are almost identical to the D9 (Digital S).
Differences lie only in the tape used, sampling rate and number of executed pixels.

(A) Video signal
High video quality thanks to the 4:1:1 (*4:2:0) component digital recording.

(Note) Descriptions marked * in the text and figures are PAL data.

• Luminance signal
The Y signal is sampled at 13.5 MHz so the Y signal bandwidth is about half the sampling frequency, or 6.75 MHz. This provides better resolution than S-VHS and current TV broadcasting (Y bandwidth of about 4.5 MHz).

• Chrominance signal

By recording the chrominance signal in a form divided into color difference signals R-Y and B-Y (component recording method), recording with excellent color reproduction and little color blur is achieved.

With VHS, the chrominance signal has been converted into a lower-frequency signal so that its bandwidth has been limited to 0.5 MHz. The DV has expanded the bandwidth by about 3 times to 1.68 MHz (3.375MHz/2) and records the chrominance components quite separately from the Y component. The sampling frequency of the R-Y and B-Y signals are 3.375 MHz (*6.75 MHz), which is 1/4 (*1/2) of the Y signal sampling frequency of 13.5 MHz. Based on this ratio, this recording method is referred to as 4:1:1 (*4:2:0 line sequential) digital component recording.

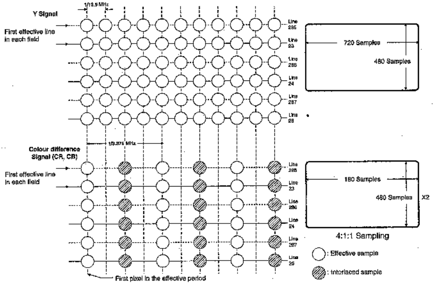

1/13.5 MHz
Y Signal
First effective line in each field
Line 285
Line 23
Line 286
Line 24
Line 287
Line 25
720 Samples
480 Samples
1/3.375 MHz
Colour difference Signal (CR, CB)
First effective line in each field
Line 285
Line 23
Line 286
Line 24
Line 287
Line 25
180 Samples
480 Samples
X2
4:1:1 Sampling
: Effective sample
: Interlaced sample
First pixel in the effective period

Fig. 8-1-1 4:1:1 Component Digital Recording

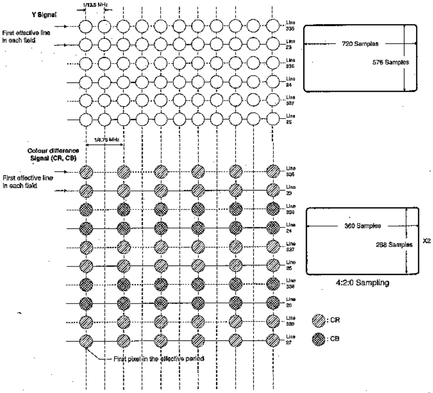

1/13.5 MHz
Y Signal
First effective line in each field
Line 335
Line 23
Line 336
Line 24
Line 337
Line 25
720 Samples
576 Samples
1/6.75 MHz
Colour difference Signal (CR, CB)
First effective line in each field
Line 335
Line 23
Line 336
Line 24
Line 337
Line 25
Line 338
Line 26
Line 339
Line 27
360 Samples
288 Samples
X2
4:2:0 Sampling
: CR
: CB
First pixel in the effective period

Fig. 8-1-2 *4:2:0 Component Digital Recording

(B) Audio signal

The DV format also records the audio digitally. Two recording formats (48 kHz, 32 kHz) are provided to allow selection according to the purpose. Compatibility with 44.1 kHz sampling is also provided for use in the reproduction of software tapes.

- **48 kHz, 16-bit high quality stereo mode**

This recording mode provides high audio quality equivalent to the DAT.

Although compression technology is used in video recording, the audio recording does not use compression.

- **32 kHz, 12-bit mode with a stereo dubbing capability**

This mode divides the audio area into two parts and records 12-bit stereo audio channels to both of them, or a total of 4 channels. This makes it possible to record 2 audio channels at the same time as performing video recording and to dub 2 additional audio channels while leaving the original audio channels.

(C) Other features

- **Video signal output**

The digital signal read out from a tape during playback is fed to the image memory to arrange the time axis before being output as the video signal. This makes it possible to reduce wow & flutter, which may be caused by head rotation irregularities or tape transport variations.

- **Timecode enabling editing**

The DV tape has a sub-code area for recording signals for use in editing. Timecodes are automatically recorded frame by frame in this area so that the video can later be edited on a per-frame basis. The sub-code area also includes the recording of index ID signals, which can be used in search and other operations later.

- **AUX data recording information on recording and shooting**

The video signal recording area on the tape records the signal called the AUX data together with the video signal. The AUX data contains information on the recording date and shooting conditions such as wide-screen shooting, and is recorded automatically during recording. Parts of the AUX data information can be displayed on the screen as required. The AUX data on the record mode, etc. is also recorded in the audio area in a similar way to the video area.

- **Digital interface for digital inputs/outputs (optional)**

All track data can be input or output directly without altering the digital format (IEEE1394 compliant).

DV terminals are provided to enable dubbing and editing using digital signals.

8.1.2 Tape Format of DV

Note) Descriptions marked * in the text and figures are PAL data.

The DV records the video and audio signals independently, in the video area and in the audio area respectively. With the video signal, the data of each frame is divided into 10 tracks (*12 tracks) before being recorded. Namely, the data of a frame is input to a memory, divided into 10 (*12), and recorded into 10 tracks (*12 tracks) using a 2-channel head by rotating the drum by 5 turns (*6 turns) in the period of one frame (33.3 ms/*40 ms) of a normal NTSC (*PAL) signal. The sub-code area records data including the timecode, recording date, index and absolute track number, and the ITI area records the reference signal of the absolute height of track (SSA) ad tracking signals. The DV does not use the tracking control track. The tracking system of the DV is called the 3-frequency (F0, F1, F2) digital pilot system, which records digital pilot signals F0 (0Hz), F1 (465 kHz) or F2 (697.5 kHz) on every track during recording. When the F0 track is reproduced, the DV controls the tracking servo so that the crosstalk levels of the pilot signals (F1, F2) in the tracks on the left and right of the F0 track become identical. The pilot signals are recorded over all the tracks.

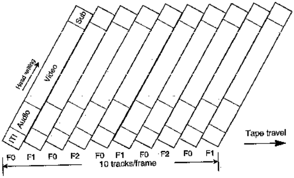


Fig. 8-1-3 NTSC Format DV Tape

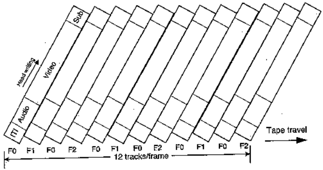


Fig. 8-1-4 PAL Format DV Tape

(A) Mini-DV cassette tape

The DV cassette uses metallic magnetic particles so that stable, high-power signals can be obtained from even very thin tracks. Metal tapes include the metal particle coated (MP) tapes and metal evaporated (ME) tapes. The Metal tape used with the DV is the ME tape which features a thin magnetic layer and low demagnetization.

• ID board and memory-in cassette (MIC)

The DV cassette has 4-contact terminals on the back label side edge of the shell. These terminals are called the "ID board terminals", and the values of resistance across the terminals express basic cassette ID (BCID) information such as the tape thickness, tape type and applications. The DV cassette can optionally incorporate a memory for storing the BCID as well as the content information. In this case, these 4 terminals are used as the serial communication terminals for the storage and readout of cassette memory contents.

As described above, the ID board terminals are used in two ways and the cassettes are available as those with or without internal memory according to the usage. The GY-DV500 and BR-DV600 are not avairable with this optional function, so information such as the content information cannot be written or read even when a cassette with internal memory is used with them.

All these models do through these terminals is read the BCID of every cassette.

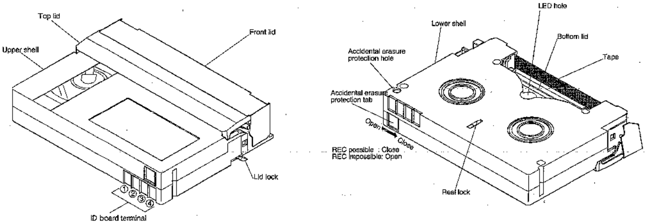
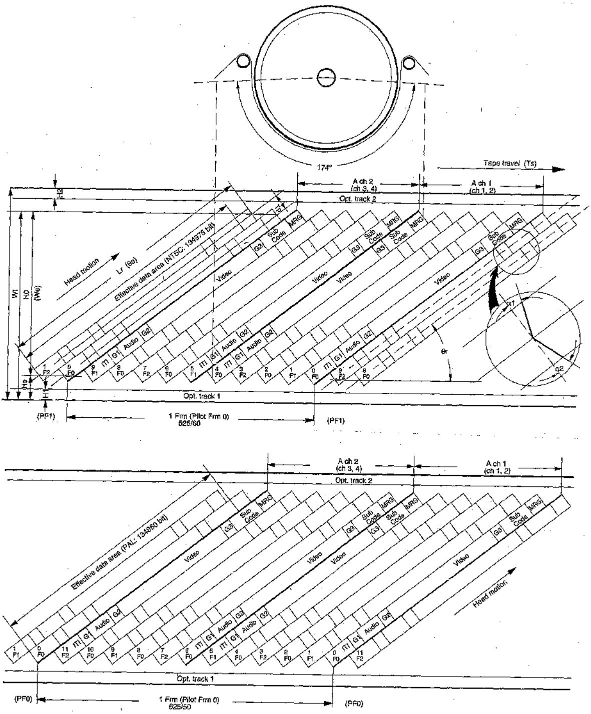

Top lid
Upper shell
Front lid
Lid lock
①
②
③
④
ID board terminal
LED hole
Lower shell
Bottom lid
Accidental erasure protection hole
Tape
Accidental erasure protection tab
Open
Close
REC possible : Close
REC impossible: Open
Reel lock

Fig. 8-1-5 External View of Mini-DV Cassette

Terminal No	ID Board			MIC
	Contents		Resistor value	Function
1	Tape thickness	7µm	Open	VDD
		Reserved	1.80kΩ ± 0.09k	
2	Tape type	ME	Open	SDA
		Reserved	6.80kΩ ± 0.34k	
		For cleaning	1.80kΩ ± 0.09k	
		MP	S/C	
3	Tape grade	For consumer	Open	SCK
		For professional	6.80kΩ ± 0.34k	
		Reserved	1.80kΩ ± 0.09k	
		For PC	S/C	
4	GND	–	–	GND

Table 8-1-2 ID Board Terminal Standard

(B) Main Standard of DV Tape Format (SD)

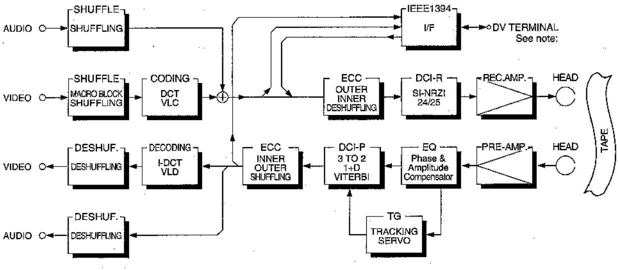


174°
Tape travel (Ts)
A ch 2 (ch 3, 4)
A ch 1 (ch 1, 2)
Opt. track 2
Opt. track 1
H2
H0
H1
He
Wt
(We)
Lr (θe)
Head motion
Effective data area (NTSC: 134975 bit)
Video
Audio
ITI
G1
G2
G3
Sub Code
MRG
θr
α1
α2
F0
F1
F2
(PF1)
1 Frm (Pilot Frm 0) 525/60
(PF1)
Effective data area (PAL: 134850 bit)
(PF0)
1 Frm (Pilot Frm 0) 625/50
(PF0)

Fig. 8-1-6 Main Standard of DV Tape Format (SD) (Track Pattern)

8.2 MAJOR SIGNAL PROCESSING OPERATIONS OF DV

Fig. 8-2-1 shows the basic configuration of the major signal processing circuitry of the DV in the form of a block diagram.



Note : PAL model is not available the signal output.

Fig. 8-2-1 Basic Configuration of Major Signal Processing Circuitry of DV

8.2.1 Flow of Video and Audio Signals in Recording Circuitry

The video and audio signal inputs/outputs shown in Fig. 8-2-1 are sampled digital signals.

The input digital video signal is shuffled block by block, so that deviations in the compression rate of the picture can be prevented. This is achieved by gathering data from various positions in the picture and compressing it. When the video signal is supplied to the ECC block for error correction later, de-shuffling is applied to return the data to the original positions in the video signal. The shuffled video signal is coded. The coding consists of replacing the image signal in the conversion block composed of multiple pixels with signals without correlation by means of discrete cosine transform (DCT).

The DCT operation consists of dividing the picture into blocks (each composed of 8 x 8 pixels) and obtaining the transform coefficient, which indicates the amount of components of the previously determined basic image pattern (64 pixels) in each block.

The VLC (Variable Length Coding) quantizes the DCT transformed signal and applies entropy coding to the quantized signal. The coding technique used here performs Run Length coding first, then applies Huffman coding.

The audio input signal is also shuffled block by block in the same way as with the video signal, but the audio signal is not compressed.

The video and audio signals are input to the ECC block, where error-correcting codes are appended to them. The error-correcting codes use product codes obtained by double coding of the Reed-Solomon integration codes.

The DCI-R (Digital Channel Interface for Recording) block performs channel coding of the recorded signals. It performs what is usually called modulation by transforming a series of digital data composed of "1" and "0" to match the properties of magnetic recording systems.

8.2.2 Flow of Video and Audio Signals in Playback Circuitry

When a digital VCR plays a recorded signal, the frequency response of the low-frequency and high-frequency components is degraded. The degradation in the frequency response of the low-frequency components is because the played signal becomes a differential waveform and a rotary transformer is used. That in the frequency response of the high-frequency components is caused by the performance of the recording tape itself and by the gap between the tape and head during recording/playback.

When a tape in which 1-bit pulses are recorded is played while the frequency response is degraded, the pulse duration is expanded and intersymbol interference results. The equalizer is used to suppress the intersymbol interference and reduce code errors.

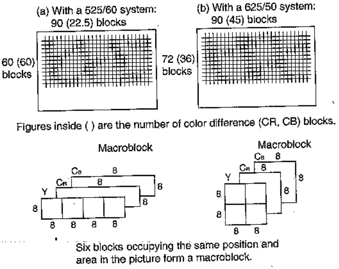
The DCI-P (Digital Channel Interface for Playback) block demodulates the signal, which has been coded for recording and turns it into a signal that can be subjected to error correction.

The ECC (Error Correcting Codes) block corrects errors while performing shuffling. The audio signal is then de-shuffled and output. The video signal is sent to the decoding block where the signal compressed by coding is expanded by means of decoding, and returns to a digital signal. The digital video signal is then de-shuffled before being output.

8.3 VIDEO/AUDIO SIGNAL PROCESSING IN RECORDING CIRCUITRY

8.3.1 Division into Blocks

As shown in Fig. 8-3-1, data of each frame is divided into macroblocks (MBs) (8 x 8 pixels) which are the basis of the DCT circuitry. Since the luminance signal and two color difference signals are sampled with different frequencies, 4-luminance signal blocks and each of the color difference signal blocks occupy the same position and area in the picture. When data of any one of the 4-luminance signal blocks is lost, the data in other blocks becomes meaningless. Therefore, the signals of every 6 blocks are processed as a single processing unit and recorded onto tape.



Figures inside ( ) are the number of color difference (CR, CB) blocks.

Six blocks occupying the same position and area in the picture form a macroblock.

Fig. 8-3-1 Division into Blocks, Macroblock

The macroblock is a group composed of the 6 blocks.

The data divided into blocks is processed by the DCT coding as described later, and the video-recording rate is compressed to 25 Mbps. In fact, however, the data of each frame is compressed to the specified number of bits, which are recorded onto the specified number of tracks on tape. Namely, when 25 Mbps is converted into the number of bits per frame, the following number of bits are recorded onto 10 (NTSC) or 12 (PAL) tracks:

$(25 \times 10^6)/30 = 833333$ bits .... (NTSC)

$(25 \times 10^6)/25 = 1000000$ bits .... (PAL)

As seen above, the data in each frame is compressed so as not to exceed the specified number of bits calculated based on the video-recording rate. This is referred to as length fixation. Although the length of the data of a frame is fixed so as not to exceed the calculated number of bits, the actual length fixation is applied per 5 macroblocks. In other words, the length of the data of 5 macroblocks is fixed so as not to exceed the following number of bits:

$833333 \times 5/1350 = 3086$ bits .... (NTSC)

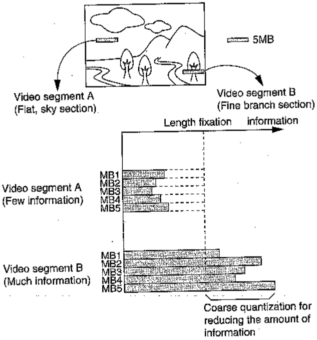
$1000000 \times 5/1620 = 3086$ bits .... (PAL)

The 5 macroblocks used as the unit of length fixation is referred to as a video segment.

8.3.2 Shuffling (Video)

The 5 macroblocks composing a single video segment is collected from a picture by means of shuffling according to a specified rule.

The objective of shuffling lies in making uniform the quantity of information that is contained in the 5 macroblocks in a video segment. The image information of a frame is not usually distributed evenly in the picture, but there are segments with a large amount of information and those with a small amount of information as shown in Fig. 8-3-2.



Coarse quantization for reducing the amount of information

Fig. 8-3-2 Distribution of Information in a Picture

As a result, if the fixed-length data obtained from 5 sequential macroblocks uses the same number of bits for each macroblock, distortion due to compression or expansion of data would be noticeable. This would depend on the screen segments (distortion is less noticeable in the segments with little information but noticeable in segments with much information). To prevent this by making the information uniform across the video segments and making distortion less noticeable, shuffling is performed in the picture.

The shuffling is performed based on the rule shown in Fig. 8-3-3.

Each picture is divided vertically into the same number as the number of macroblocks in a video segment (5), and divided horizontally into the same number as the number of tracks used to record the data of 1 frame onto tape (NTSC: 10, PAL: 12).

The blocks divided in this way are referred to as superblocks.

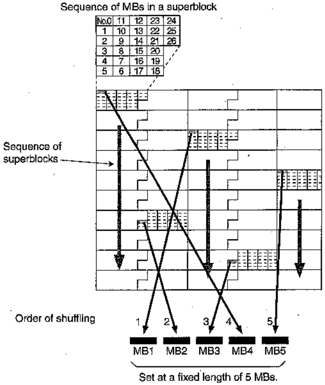

Sequence of MBs in a superblock
No.0 11 12 23 24
1 10 13 22 25
2 9 14 21 26
3 8 15 20
4 7 16 19
5 6 17 18
Sequence of superblocks
Order of shuffling
1
2
3
4
5
MB1
MB2
MB3
MB4
MB5
Set at a fixed length of 5 MBs.

Fig. 8-3-3 Shuffling Technique (Example with 525/60)

With shuffling, the first macroblock (No. 0) in each of the 5 superblocks are collected to form a video segment as shown in Fig. 8-3-3, and the next video segment is formed by collecting the first macroblocks (No. 1) of the same 5 superblocks. When all of the macroblocks in the 5 superblocks have been collected, data collection of the next 5 superblocks starts.

8.3.3 DCT

The video segments formed by shuffling are DCT transformed per (8 x 8) blocks. There are two DCT transform modes including the stationary mode and the dynamic mode.

(1) Stationary mode (8 x 8 DCT mode)
This is the basic mode, executing (8 x 8) DCT transform to every (8 x 8) pixels in blocks.

(2) Dynamic mode (2 x 4 x 8 DCT mode)
The (8 x 8) blocks are divided into two (4 x 4) blocks called fields 1 and 2, and a (4 x 8) DCT transform is applied to every (4 x 8) pixels.
The following paragraph explains this mode by taking the case in which an object moves toward the right as an example.

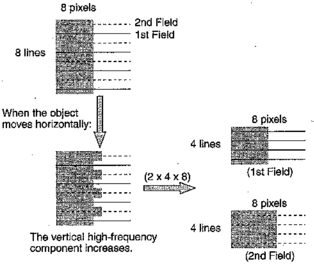

8 pixels
2nd Field
1st Field
8 lines
When the object moves horizontally:
(2 x 4 x 8)
The vertical high-frequency component increases.
8 pixels
4 lines
(1st Field)
8 pixels
4 lines
(2nd Field)

Fig. 8-3-4 (2 x 4 x 8) DCT Transform in Motion Mode

When the object does not move, the data in the horizontal direction contains the high-frequency component but the data in the vertical direction contains only the DC current. On the other hand, when the object moves in the horizontal direction, the position of the object at the time of 1st field scanning is different from that at the time of 2nd field scanning, so the picture of the object in a frame appears to have ridged edges. The high-frequency component increases in the vertical direction data as well as in the horizontal direction data. In such a case, the (8 x 8) blocks are divided into two pairs of (4 x 8) blocks for fields 1 and 2, and (4 x 8) DCT transform is applied to every (4 x 8) pixels.
This method makes it possible to reduce any increases in the high-frequency component in the vertical direction data and prevents a drop in the compression rate.
Whether a DCT transform is performed in the stationary mode or in the dynamic mode is decided by detecting the (8 x 8) blocks in each video segment by the motion detector circuit located before the DCT transform circuit.
The data of a block in stationary mode is composed of one DC component and 63 AC components. But, in dynamic mode each one of the two (4 x 8) blocks is composed of a DC component and 31 AC components. To allow the dynamic mode data to be processed in the same way as the stationary mode data, the dynamic mode processing calculates the sum and differences of the factors of the same order and form (8x 8) blocks as shown in Fig. 8-3-5.

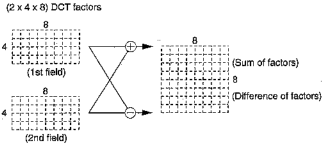

(2 x 4 x 8) DCT factors
8
4
(1st field)
8
4
(2nd field)
+
−
8
(Sum of factors)
8
(Difference of factors)

Fig. 8-3-5 Processing of DCT Transform Factors in Dynamic Mode

The above processing allows both the dynamic mode data and stationary mode data to be handled as data composed of one DC component and 63 AC components in the subsequent quantization processing.

8.3.4 Quantization

(A) Data quantity estimation

After all of the blocks in a video segment have been DCT transformed, the video segment is stored in the buffer. At this time, the data quantity estimation block selects the quantizer for use in quantizing the video segment.

With DCT transform, normalization is performed so that the DCT factors have a 10-bit dynamic range for the 8-bit pixel block. The DCT factors are divided by an integer called the quantization step and allocated to a smaller number of bits before being subjected to variable-length coding (VLC). This operation (division) is referred to as re-quantization, or simply quantization. The quantization reduces the values of the factors, turning many of 0 in the high frequencies. As the VLC in the subsequent stage performs code allocation by forming value 0 run lengths and the non-0 factor after it into a group, so the quantization improves the coding efficiency. As the VLC consists of simply allocating codes to factors, the code quantity (number of bits) is controlled by the VLC block.

(B) Quantization

Each quantizer is composed of a set of 4 quantization steps as shown in Fig. 8-3-6, and the factors in a block are divided into 4 areas. The data is quantized in the 4 areas using different quantization steps. The factors are shifted from low-frequency factors to high-frequency factors as the area number increases, so the quantization of high-frequency factors are coarser than for low-frequency factors. This utilizes the fact that the distortion of high-frequency factors is less noticeable to human vision even when they are coarsely quantized.

(8 x 8) DCT

Horizontal direction

Vertical direction	0	1	2	3	4	5	6	7
0	DC	0	0	1	1	1	2	2
1	0	0	1	1	1	2	2	2
2	0	1	1	1	2	2	2	3
3	1	1	1	2	2	2	3	3
4	1	1	2	2	2	3	3	3
5	1	2	2	2	3	3	3	3
6	2	2	2	3	3	3	3	3
7	2	2	3	3	3	3	3	3

(2 x 4 x 8) DCT

Horizontal direction

Vertical direction	0	1	2	3	4	5	6	7	
0	DC	0	1	1	1	2	2	3	(Sum)
1	0	1	1	2	2	2	3	3	
2	1	1	2	2	2	3	3	3	
3	1	2	2	2	3	3	3	3	
4	0	0	1	1	2	2	2	3	(Difference)
5	0	1	1	2	2	2	3	3	
6	1	1	2	2	2	3	3	3	
7	1	2	2	3	3	3	3	3	

	Class No.				Area No.			
	0	1	2	3	0	1	2	3
Quantizer No.	15				1	1	1	1
	14				1	1	1	1
	13				1	1	1	1
	12	15			1	1	1	1
	11	14			1	1	1	1
	10	13		15	1	1	1	1
	9	12	15	14	1	1	1	1
	8	11	14	13	1	1	1	2
	7	10	13	12	1	1	2	2
	6	9	12	11	1	1	2	2
	5	8	11	10	1	2	2	4
	4	7	10	9	1	2	2	4
	3	6	9	8	2	2	4	4
	2	5	8	7	2	2	4	4
	1	4	7	6	2	4	4	8
	0	3	6	5	2	4	4	8
		2	5	4	4	4	8	8
		1	4	3	4	4	8	8
		0	3	2	4	8	8	16
			2	1	4	8	8	16
			1	0	8	8	16	16
			0		8	8	16	16

Fig. 8-3-6

(C) Classification

Each block in a video segment is classified into one of 4 classes before being quantized. The quantization steps of the quantizers vary depending on the class numbers (see Fig. 8-3-6). Table 8-3-1 shows the definitions of the 4 classes.

Class No.	Definition
0	Block with which quantization distortion after compression is highly noticeable. The absolute value of the AC factor should not exceed 225.
1	Block with which quantization distortion after compression is less noticeable than Class 0. The absolute value of the AC factor should not exceed 225.
2	Block with which quantization distortion after compression is less noticeable than Class 1. The absolute value of the AC factor should not exceed 225.
3	Block with which quantization distortion after compression is little noticeable or the absolute value of the AC factor exceeds 225.

Table 8-3-1 Definitions for Classification

The Table 8-3-1 means that a block with a larger class number has a more approximate degree of definition (activity). The data in such a block is quantized relatively roughly to compress the data quantity. Rather approximate quantization of picture areas with low activity does not cause odd sensations for the human vision, but approximate quantization of those with high activity does cause odd sensations. The blocks with low activity in each segment are quantized as roughly as possible with a reduced number of allocated bits, unless the odd sensations are not felt. However, the blocks with high activity are quantized using an increased number of allocated bits to improve the picture quality experienced by the human vision.

A block containing factors with a larger absolute AC factor than 255 is classified as Class 3, and subjected to an operation called initial shifting before quantization. This operation divides an AC factor over 255 by 2 so that errors do not occur in the VLC operation.

Class No.	0	1	2	3
Initial shifting	Not applied	Not applied	Not applied	Applied

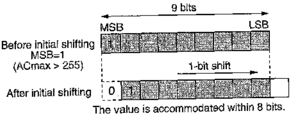


Fig. 8-3-7 Initial Shifting

While the AC factor before quantization consists of 10 bits, or 9 bits excluding the sign bit, the VLC in the subsequent stage can codify a non-0 factor value only into an 8-bit code. Initial shifting is performed to deal with this. As a result, a factor that has a value in the 9th bit (SMB) (i.e. a factor over 255) can be accommodated in 8 bits and processed by VLC. Fig. 8-3-6 shows that an increase in the class No. increases the quantization steps in the same quantizer No. or that quantization of a larger class No. is more approximate.

Although the quantization steps of Class 2 look less than for those of Class 3, this is because the Class 3 data has been subjected to initial shifting before quantization. The actual quantization steps of Class 3 are more approximate than in those of Class 2.

8.3.5 VLC

After division into (8 x 8) blocks by DCT transform, the energy of pixels are concentrated in the DC component and the vertical and horizontal vertical factors become almost null. To code these factors, coding uses a technique for varying the code length according to the incidence of the factors.

This coding technique varying the code length is referred to as variable length coding (VLC).

(A) Entropy coding

As the VLC achieves efficient coding by allocating short codes to data with a high DCT factor incidence and long codes to data with a low incidence, it is sometimes called the entropy coding. The entropy coding can be expressed with an entropy function.

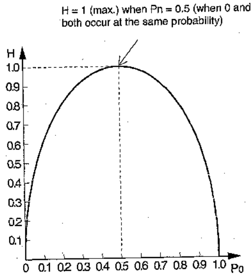
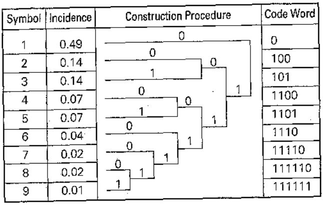


Fig. 8-3-8 Entropy Function

When VLC approaches the above function, it is regarded as coding with a high compression rate.

(B) Huffman coding

The DV uses Huffman codes to improve the compression efficiency. The Huffman codes determines the minimum average code length of information with a known incidence probability. Table 8-3-2 shows the method of construction of Huffman codes. The symbols in the table should be regarded as the levels of pixel values.



Symbol	Incidence	Construction Procedure	Code Word
1	0.49		0
2	0.14		100
3	0.14		101
4	0.07		1100
5	0.07		1101
6	0.04		1110
7	0.02		11110
8	0.02		111110
9	0.01		111111

Table 8-3-2 Construction of Huffman Codes

The Huffman coding uses the following procedure.

(1) Information source symbols 1 to 9 are arranged in the order of incidence probability.

(2) For the symbol with the lowest incidence and that with the second-lowest incidence, "0" is allocated to one and "1" is allocated to the other. (Which of the two symbols is "0" and which is "1" can be decided arbitrarily.)

(3) Then, the above two symbols are considered to be joined together as a single symbol. The incidence probability of the joined symbols should be equal to the sum of the incidence probabilities of the two symbols before joining.

(4) By considering the joined symbols as new individual symbols, these symbols and other symbols (which should exclude the two symbols which were joined) are rearranged in the order of incidence probability.

(5) Steps (2) to (4) are repeated until the number of symbols becomes 1.

(6) The values (0 or 1) allocated to the original symbols in step (2) are read in the reverse order. The read values form the code word for the symbols.

A Huffman code constructed in this way can be decoded instantaneously because, by following the bits one by one from the first bit at the time of decoding, the end of a code word can be determined without referring to the head of the next code word.

As the VLC used with the DV is based on Huffman coding combined with run length coding, it is called "modified 2-dimensional Huffman coding".

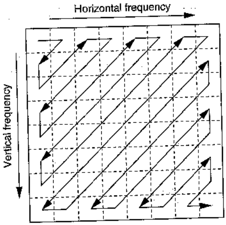
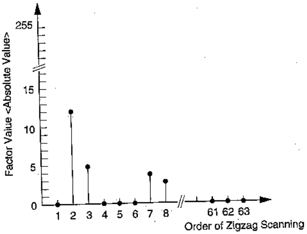


Fig. 8-3-9 Zigzag Scanning of DCT Factors

Among the factors transformed by 2D DCT, the 63 AC factors other than the DC component factor are rearranged by zigzag scanning as shown in Fig. 8-3-9. When the AC factors are rearranged in the order of scanning, the result is as shown in Fig. 8-3-10, where the scanned factor series is divided into a group of sequential 0 factors followed by a group of non-0 factors. A code called the EOB (End Of Block) is appended after the last non-0 factor scanned.

After the factors are transformed into a group of 0-value run length and a group of non-0 factor values, a Huffman code table is compiled according to the incidence probabilities of these groups and VLC is applied based on this.



Factor series = {0, 12, 5, 0, 0, 0, 4, 3,... 0, 0, 0}

↓ Transform into (0 run length + non-0 factor values)

(1, 12), (0, 5), (3, 4), (0, 3)... (EOB)

↓ VLC

(111011s), (100s), (11011s),... (1110)

s: Sign bit

Fig. 8-3-10 2D Huffman Coding

8.3.6 Shuffling (Audio)

Unlike the video signal, the audio signal is not compressed. It is subjected only to shuffling as preparation for the ECC.

Table 8-3-3 shows the basic modes of the DV.

Mode	Channels	Sampling Frequency	Quantization
48 k	2	48 kHz	16-bit linear
44.1 k		44.1 kHz	
32 k		32 kHz	
32 k	4	32 kHz	12-bit nonlinear

Table 8-3-3 Basic Audio Modes

In the 2-channel modes, the quantization is 16-bit linear and the sampling frequency can be selected from 48 kHz, 44.1 kHz or 32 kHz. One of the 2 channels is recorded in the first 5 tracks of the 10 tracks of an NTSC frame (first 6 tracks of the 12 tracks of a PAL frame) after shuffling. Therefore, when an error occurs with a track, 1/5 (or 1/6) interpolation is applied.

8.3.7 De-shuffling

The compressed video data is recorded on tracks on tape. The video data recording area of each track is divided into sub-units called the sync blocks (SBs). The number of SBs where video data is recorded is 135 per track, and the number of SBs per frame is:

135 x 10 = 1350 .... (NTSC)
130 x 12 = 1620 .... (PAL)

These values are equal to the number of macroblocks per frame. Therefore, the compressed video segment data (5 macroblocks) is packed into 5 SBs and recorded.

Fig. 8-3-11 shows the packing of video segment data into 5 SBs.

<Step 1>
- The macroblock data is packed into the specified area (fixed area) on a per-DCT block basis.
- Overflow data is stored in the macroblock memory.
- This step is performed for each macroblock.

<Step 2>
- The data in MB memory is packed in the vacant area of the same SB.
- Overflow data is stored in the VS (Video Segment) memory.
- This step is performed for each macroblock.

<Step 3>
- The data in theVS memory is packed in the vacant areas in the 5 macroblocks.

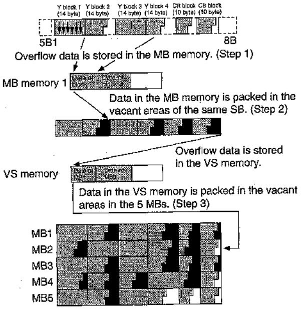

Y block 1 (14 byte)
Y block 2 (14 byte)
Y block 3 (14 byte)
Y block 4 (14 byte)
CR block (10 byte)
CB block (10 byte)
5B1
8B
Overflow data is stored in the MB memory. (Step 1)
MB memory 1
Data of block 1
Data of block 3
Data in the MB memory is packed in the vacant areas of the same SB. (Step 2)
Overflow data is stored in the VS memory.
VS memory
Data in the VS memory is packed in the vacant areas in the 5 MBs. (Step 3)
MB1
MB2
MB3
MB4
MB5

Fig. 8-3-11 Packing of Compressed Data in SB

The section corresponding to the data area of each SB(unit) is divided into the number of DCT blocks per macroblock (fixed areas) and the data in the DCT blocks is packed in priority in the fixed areas. When data packed in 5 units is recorded, it is not recorded in 5 sequential SBs.

After the data in each video segment has been packed in 5 units, the data is de-shuffled before being recorded. The data of a frame, composed by the de-shuffling, is recorded sequentially on the SBs on tape as shown in Fig. 8-3-12.

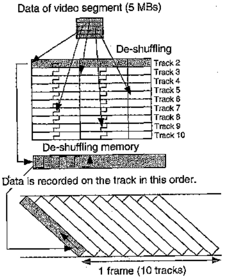

Data of video segment (5 MBs)
De-shuffling
Track 2
Track 3
Track 4
Track 5
Track 6
Track 7
Track 8
Track 9
Track 10
De-shuffling memory
Data is recorded on the track in this order.
1 frame (10 tracks)

Fig. 8-3-12 De-shuffled Recording (NTSC)

The reason why the shuffled data is not recorded on tape but de-shuffled before being recorded is to make the picture quality in variable-speed playback easier to view.

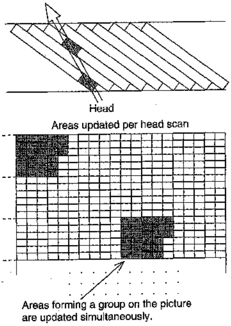

Head
Areas updated per head scan
Areas forming a group on the picture are updated simultaneously.

Fig. 8-3-13 Picture Updating in Variable-Speed Playback

Fig. 8-3-13 shows the picture updating by data reproduced during variable-speed playback. The picture is easy to see because the de-shuffling before recording causes the reproduced data to form a sequential group.

8.3.8 Error Correction

Error correction consists of correcting errors occurring in the data. For this purpose, data is provided with regularity by adding redundant parts. The error correction codes are the mathematical systematization of how to add the redundant parts, and the theory of this is referred to as the coding theory.

(A) Principles of error detection and error correction

With the DV, it may happen that data recorded as "0" is reproduced as "1" or data recorded as "1" is reproduced as "0" due to thermal noise of the recording/playback amplifier or dust or scratches on the tape surface. The error correction detects and corrects such code error produced in the process of recording or playback.

In the following, the principles of error detection and error correction will be explained by using codes composed by adding a 3-bit redundant part to every 2 bits of data as shown below.

Information part		Information part	Parity check part
(00)	→	(00	110)
(01)	→	(10	101)
(10)	→	(10	011)
(11)	→	(11	111)

With the coding theory, the part for data is called the information part, the redundant part is called the parity check part, and the total of information part and parity check part is called the code word. The operation of transforming the information part into code word is referred to as coding.

Let us assume that a code word (00110) corresponding to data (00) has been recorded and is reproduced with an error in 1 bit (01110). When the reproduced series is compared with previously defined 4 code words, it may be known that the former coincides with none of the latter. These are the principles of error detection.

When the above situation is verified in more detail, it can be established that the reproduced series (01110) is different by 1 bit from the code word (00110) and by 2 or more bits from other code words.

The fact that a code word is most similar to the reproduced series means that the probability that it is the recorded code word is highest. Therefore, coding errors can be corrected by considering that the most similar code word to the reproduced series is the recorded code word. These are the principles of error correction.

The operation of correcting errors in the reproduced series is referred to as decoding.

(B) Hamming distance

The error detection and correction capabilities of error correction coding can be defined in terms of the hamming distance between the code words. The hamming distance is the number of dissimilar components when two code words are compared component by component. For example, assuming that code word (00110) is C_1 and code word (01101) is C_2, hamming distance dH (C_1, C_2) is 3. If code word (10011) is C_3 and code word (11111) is C_4, hamming distance dH (C_3, C_4) becomes 2.

Fig. 8-3-14 shows the scheme of the relationship between the error detection and correction capabilities and the hamming distance.

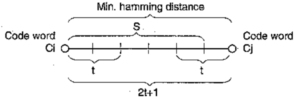


Fig. 8-3-14 Expressions of Error Detection and Correction Capabilities by Hamming Distance

To enable error correction coding, detect all of S or more errors, the minimum value of the hamming distance between code words (minimum hamming distance) should be S + 1. This is because, if the minimum hamming distance is less than S, code word Ci could be turned into another code word Ci if there are S error items.

Similarly, to correct t or fewer errors, the minimum hamming distance between code words should be $2t + 1$ or more. This is because, if the minimum hamming distance is less than $2t$, code word Cj which has a shorter hamming distance than Ci would exist if t error items occur with Ci. The hamming distances between the code words of the above-mentioned code are:

$$d_H((00110), (01101)) = 3$$
$$d_H((00110), (10011)) = 3$$
$$d_H((00110), (11111)) = 3$$
$$d_H((01101), (10011)) = 4$$
$$d_H((01101), (11111)) = 2$$
$$d_H((10011), (11111)) = 2$$

Therefore, the minimum hamming distance between these code words is 2. Thus, as the number of errors that can be detected is:

S = 1 (because S + 1 = 2)

This means that the error of a bit can be detected.

It was described above that the error of a bit in code word (00110) can be corrected. This is because the minimum hamming distance between only code word (00110) and other code words is 3. Therefore:

$t = 1$ (because $2t + 1 = 3$)

However, correction of error of a bit is not possible with other code words, with which only error detection is possible.

(C) Simple error correction codes

Examples of simple error correction codes will be described in the following.

(1) Simple parity check code

The parity check code is composed of a k-bit information part and 1-bit parity check part. The code with which parity is selected so that the number of "1" contained in a code word is an even number is referred to as the even parity code. That with which parity is selected so that the number of "1" contained in a code word is an odd number is referred to as the odd parity code. For example, a 3-bit code may have even parity codes as follows:

(00) → (000)
(01) → (011)
(10) → (101)
(11) → (110)

All of the hamming distances between the 4 code words are 2, so a 1-bit error occurring in any code word can be detected.

(2) Repetition code

The repetition code consists of n times of repetitions of 1-bit information parts, and the number of code words is 2. For instance, a 3-bit code has two repetition codes as follows:

(0) → (000)
(1) → (111)

The minimum hamming distance between these codes is 2, so a 1-bit error occurring in a code word can be corrected.

(3) (7, 4) hamming code

The (7, 4) hamming code consists of a 4-bit information part (i_3, i_2, i_1, i_0) and a 3-bit parity check part (P_2, P_1, P_0) which is determined according to the following rule.

$$\left.\begin{array}{l} P_0 = i_3 + i_2 \qquad + i_0 \\ P_1 = \qquad i_2 + i_1 + i_0 \\ P_2 = i_3 + i_2 + i_1 \end{array}\right\} \ldots\ldots (8.3.1)$$

In expressions (8.3.1), operators "*" represent exclusive OR, so $0 + 0 = 0$, $0 + 1 = 1$, $1 + 0 = 1$, and $1 + 1 = 0$.

The (7, 4) hamming code has 4 information bits, or $2^4 = 16$ code words. Table 8-3-4 shows all of the code words.

Information Part				Parity Check Part		
i_3	i_2	i_1	i_0	P_2	P_1	P_0
0	0	0	0	0	0	0
1	0	0	0	1	0	1
0	1	0	0	1	1	1
1	1	0	0	0	1	0
0	0	1	0	1	1	0
1	0	1	0	0	1	1
0	1	1	0	0	0	1
1	1	1	0	1	0	0
0	0	0	1	0	1	1
1	0	0	1	1	1	0
0	1	0	1	1	0	0
1	1	0	1	0	0	1
0	0	1	1	1	0	1
1	0	1	1	0	0	0
0	1	1	1	0	1	0
1	1	1	1	1	1	1

Table 8-3-4 List of Code Words of (7, 4) Hamming Code

This table shows that the minimum hamming distance of the code is 3 and that a 1-bit error can be corrected.

(4) Basic knowledge on algebra

The examples of error correction codes used in the description of the previous section are beginner-type codes, and their error detection and correction capabilities are insufficient for application in the DV.

The error correction codes with practical error detection and correction capabilities for use with the DV are constructed based on abstract algebra. In the following, the minimum required knowledge on the algebra for understanding the error correction will be described. If you want to gain more knowledge, please also refer to books on mathematics.

(a) Galois field

Here, the term "field" refers to the set of elements with which the four arithmetical operations of addition, subtraction, multiplication and division can be defined.

The term "field" is used because its functions are working organically, and have come from German word "Körper". For example, a real number or complex number is a field. However, when the term "field" is used with error correction codes, it does not mean a field with an infinite number of elements such as a real number, but means a finite field composed of a finite number of elements.

The "element" is what belongs to a set.

For example, if there is "a" which belongs to set "M", it is said, "a is an element of M". The fact that "a" belongs to "M" is expressed using a symbol as "a ∈ M2". "∈" is the symbol of the initial letter of "element". If "a" does not belong to "M", it is expressed as "a ∉ M".

A finite field is also called the Galois field, after the French mathematician Evariste Galois (Oct. 25, 1811 - May 31, 1832) who created one of the basic algebra theories. A Galois field composed of P elements is expressed as GF(P).

The simplest Galois field is a GF(2) composed of elements (0, 1). The addition in GF(2) is defined as exclusive OR and the multiplication can be defined as multiplication of ordinary integers.

Table 8-3-5 shows the operation tables of GF(2).

	0	1
0	0	1
1	1	0

(a) Addition

	0	1
0	0	0
1	0	1

(b) Multiplication

Table 8-3-5 Operation Tables of GF(2)

(b) Extension field

The complex number field is created by adding root "i" of "$x^2 + 1 = 0$", the polynomial which cannot be factorized any more in a real number field (irreducible polynomial) to a real number field. In the same way, by adding a root of an irreducible polynomial in Galois field GF(P) to GF(P), it is possible to create a field GF(P^m) where the number of elements is equal to P^m which is a P's power. This operation is referred to as a field extension. GF(P) is called the ground field and GF(P^m) is called the extension field.

For example, assume that there is an irreducible cubic polynomial as follows:

$$x^3 + x + 1 = 0,$$

If there is an extension field GF (2^3) created by a root of the above polynomial "α" to GF (2), "0", "1" and "α" are the elements of extension field GF (2^3). Then, since multiplication should be definable in a field, all of α's powers become the elements of GF (2^3). As for the α's powers, since "α" is the root of polynomial $x^3 + x + 1 = 0$,

$$\alpha^3 = \alpha + 1$$

Therefore, this relationship means the following:

$$\alpha^0 = 1$$
$$\alpha^1 = \alpha$$
$$\alpha^2 = \alpha^2$$
$$\alpha^3 = \alpha + 1$$
$$\alpha^4 = (\alpha + 1)\,\alpha = \alpha^2 + \alpha$$
$$\alpha^5 = (\alpha^2 + \alpha)\,\alpha = \alpha^2 + \alpha 1 + 1$$
$$\alpha^6 = (\alpha^2 + \alpha + 1)\,\alpha = \alpha^2 + 1$$
$$\alpha^7 = (\alpha^2 + 1)\,\alpha = 1$$

:

(Repeated)

α's power after α^7 are repetitions of the above.

Fig. 8-3-15 shows this relationship from a different viewpoint. In this figure, since the cycle is closed, α's power after α^7 are replaced by values of α^6 or below.

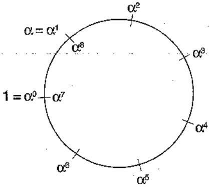


Fig. 8-3-15 Cycle of GF (2^3)

(5) Cyclic code

The cyclic codes are important codes that can be coded or decoded easily.

The cyclic code has the following properties:

- The sum of arbitrary code words is a code word.
- The series obtained by cyclic shifting of code words becomes a code word.

(6) Hamming code

When one of the roots of an irreducible m-order polynomial in GF(2) is assumed to be α, the maximum period until α's power returns to the original number is $2^m - 1$ (see Fig. 8-3-15).

An irreducible polynomial which has a root α with which the period is $2^m - 1$ is called the primitive polynomial, and α in this polynomial is called a primitive element.

GF(2^m) is an extension field created by adding a primitive element with a period of $2^m - 1$ to GF(2). The hamming code is a cyclic code which uses a primitive polynomial as the generation polynomial, and its parameters are as shown below.

Code length : $n = 2^m - 1$
Information amount : $k = n - m$
Min. hamming distance : $d_{MIN} = 3$

A hamming code with code length of n and information amount of k is called a (n, k) hamming code. Since the minimum hamming distance is 2, any 1-bit error occurring in the code word can be corrected.

(7) BCH code

The BCH (Bose-Chauduri-Hocgenghem) code extends the error correction of a Hamming code to 2 bits or more. The BCH codes with t-bit correction become the cyclic codes of code table n with which generation polynomial G(x) is a minimum-order polynomial having $\alpha, \alpha^2, \ldots \alpha^{2t}$ as the roots, assuming that α is a primitive root of GF(2^m) and that $n = 2^m - 1$.

(8) Reed-Solomon code

The BCH code described in above (7) is defined on GF(2). The Reed-Solomon code is an extension of the above to GF(2^m). Its error detection and correction are applied per symbol, which is an element of the extension field.

In general, a Reed-Solomon code with code length of n and information amount of k is called the (n, k) RS code.

(9) Reed-Solomon product code

Assuming that C_1 is (n_1, k_1) codes and C_2 is (n_2, k_2) codes, the product code of them can be obtained by coding k_1 columns, each composed of k_2 symbols, with C_2, then coding k_2 rows, each composed of k_1 symbols with C_1. Fig. 8-3-16 shows the construction of product code.

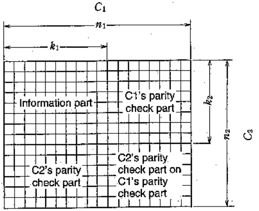


Fig. 8-3-16 Construction of Product Codes

The C2's parity check part on C1's parity check part is identical to the C1's parity check part on C2's parity check part. As a result, the same product code can be obtained by coding C1 before coding C2. The DV uses the Reed-Solomon product code obtained by a double coding of the Reed-Solomon code.

8.3.9 Data Structure

Random errors and burst errors due to dropouts on tape occur with the magnetic recording/playback circuitry of the DV. To deal with this, the DV records data by turning into sync blocks. Fig. 8-3-17 shows the DV data structure.

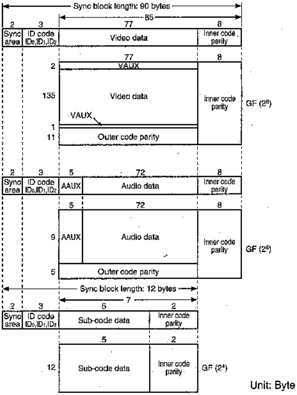

Sync block length: 90 bytes
85
2
3
77
8
Sync area
ID code ID0,ID1,ID2
Video data
Inner code parity
77
8
2
VAUX
135
Video data
Inner code parity
GF (2⁸)
VAUX
1
11
Outer code parity
2
3
5
72
8
Sync area
ID code ID0,ID1,ID2
AAUX
Audio data
Inner code parity
5
72
8
9
AAUX
Audio data
Inner code parity
GF (2⁸)
5
Outer code parity
Sync block length: 12 bytes
7
2
3
5
2
Sync area
ID code ID0,ID1,ID2
Sub-code data
Inner code parity
5
2
12
Sub-code data
Inner code parity
GF (2⁴)
Unit: Byte

Fig. 8-3-17 Data Structure

The video and audio uses the same sync block configuration to reduce the scale of hardware. The video or audio data forms a sync block together with the sync area, the ID code indicating the data attributes and the inner code parity.

The byte counts of the sync area and ID code in Fig. 8-3-17 are the values before the 24/25 conversion (by a converter circuit which produces digitally the pilot signal for use in tracking during playback). In practice, however, they are 24/25-converted and become scrambled interleaved NRZI-converted signals before being recorded onto tape. The following 17-bit patterns have been defined as sync patterns.

- Audio/Video sectors

  Sync-D : 00011111111110001
  Sync-E : 11100000000001110
  MSB LSB
- Sub-code sector

  Sync-F : 00000111111111101
  Sync-G : 11111000000000010
  MSB LSB

The ID code is composed of 3 bytes including two ID bytes and a parity byte.

The ID bytes of a video or audio sector are:

4 bits of sequence number for indicating the continuity of frame, 4 bits of track pair number indicating the track number, and 8 bits of sync block number indicating the arrangement of sync blocks in each track.

(1) Error correction in the ID code area

In the ID code area, (12, 8, 3) BCH codes are used for common error correction to the audio, video and sub-code sectors.

The configuration is as shown below.

Primitive polynomial: $x4 + x + 1$

ID_0: C_{15} C_{14} C_{13} C_{12} C_{11} C_{10} C_9 C_8

ID_1: C_7 C_6 C_5 C_4 C_3 C_2 C_1 C_0

ID_P: P_7 P_6 P_5 P_4 P_3 P_2 P_1 P_0

MSB LSB

$ID\text{-}CW_0$: C_{14} C_{12} C_{10} C_8 C_6 C_4 C_2 C_0 P_6 P_4 P_2 P_0

$ID\text{-}CW_1$: C_{15} C_{13} C_{11} C_9 C_7 C_5 C_3 C_1 P_7 P_5 P_3 P_1

The parity can be expressed as follows.

$$
\begin{aligned}
P_7 &= C_{15} + C_{11} + C_7 + C_5 \\
P_5 &= C_{15} + C_{13} + C_9 + C_5 + C_3 \\
P_3 &= C_{15} + C_{13} + C_{11} + C_7 + C_3 + C_1 \\
P_1 &= + C_{13} + C_9 + C_7 + C_1 \\
P_6 &= C_{14} + C_{10} + C_6 + C_4 \\
P_4 &= C_{14} + C_{12} + C_8 + C_4 + C_2 \\
P_2 &= C_{14} + C_{12} + C_{10} + C_6 + C_2 + C_0 \\
P_0 &= + C_{12} + C_8 + C_6 + C_0
\end{aligned}
$$

As the contents of ID code have regularity (inertia) between successive sync blocks, it is also possible to apply only the error detection.

(2) Error correction in the video and audio areas

The video data and audio data are composed of Reed-Solomon product codes of GF (2^8) as shown in Fig. 8-3-17. With internal codes, a common code length is used to reduce the burden on the hardware.

(a) Inner codes: same video and audio (85, 77)

α : Primitive element

Primitive polynomial : $x^8 + x^4 + x^3 + x^2 + 1$

Generation polynomial : $g = (x + 1)(x + \alpha)(x + \alpha^2)\ldots(x + \alpha^7)$

As 8 bytes of parity are added, up to 4 errors can be corrected.

(b) Outer codes: Video (149, 138), audio (14, 9)

Primitive polynomial: $x^8 + x^4 + x^3 + x^2 + 1$

Generation polynomials:

Video $g = (x + 1)(x + \alpha)(x + \alpha^2)\ldots(x + \alpha^{10})$

Audio $g = (x + 1)(x + \alpha)(x + \alpha^2)(x + \alpha^3)(x + \alpha^4)$

As 11 parity bytes are added to the video data, the maximum burst error correction length assuming that all random errors are corrected by inner code is 85 x 11 = 935 bytes, which corresponds to correction of error due to a defect of about 0.3 mm in the widthwise direction of tape.

Similarly, 5 parity bytes are added to the audio data so the maximum burst error correction is 85 x 5 = 425 bytes, which corresponds to correction of error due to a defect to about 0.14 mm in the widthwise direction of tape.

(3) Error correction in the sub-code area

Errors in the sub-code area in each track are corrected by using only the inner codes without using the produce codes. Multiple write in a frame is adopted to improve the reliability.

Sub-code (14,0) GF(2^4) Reed-Solomon code

Primitive polynomial : $x^4 + x + 1$

Generation polynomial : $g = (x + 1)(x + \alpha)(x + \alpha^2)(x + \alpha^3)$

8.3.10 DCI

Channel coding of recording signals is to convert the digital information signals composed of "1" and "0" according to the properties of the magnetic recording/playback circuitry. As the DV transports tape by means of helical scanning of a rotary drum, the signal processing of the recording/playback circuitry is subject to the following restrictions.

(1) The signal-to-noise ratio (S/N) in playback should be good. If the S/N is poor, a large number of random errors make error correction difficult.

(2) The DC and low-frequency components should be small. The magnetic recording system has a differential wave type transfer characteristic and a rotary transformer is used in signal exchange between the magnetic heads and recording/playback circuitry. Therefore, the DC and low-frequency components (where signal "1" or "0" continues) cannot be recorded or reproduced.

(3) The timing clock should be reproduced. If a stable reproduce clock which is synchronized with the reproduce signal by shortening successive "1" or "0" of data, jitter may occur.

To deal with the above restrictions, the DV uses the scrambled interleaved NRZI technique. This technique is called scrambled interleaved because the bit series of every other bit are identical to the NRZI system and that two NRZI series are alternating. It is also called PR4 (Partial Response class IV) or PR(1, 0, -1).

(A) Interleaved NRZI

The interleaved NRZI system has a close frequency characteristic to the characteristic of magnetic recording circuitry and the technique is used with many digital VCRs.

When there is an isolate pulse, inter-code interference producing -1 occurs in 2 bits after it. This technique shapes the reproduced waveform by utilizing the inter-code interference. Fig. 8-3-18 shows the process in which the input data series is reproduced by PR4 through tape transport. When a data series is input to point A it is converted by the Precoder after signal processing. The data and frequency spectrum are as shown by B in the figure after conversion. The data is then turned into a differential waveform according to the differentiation property of the magnetic recording/playback circuitry, and the loss in the high-frequency band is compensated by the equalizer to become waveform C. Then, a signal delayed by 1 clock and the original signal are mixed to become waveform D. By applying 3-value detection to convert data "-1" into "1", output data E which is identical to the input data can be obtained.

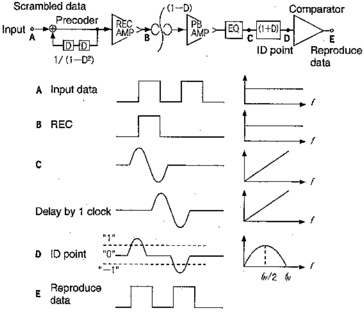


Fig. 8-3-18 Si-NRZI

This signal flow can be expressed using delay parameter D as follows.

Precoder : $1/(1 - D^2)$

Reproduce circuitry : $1 - D$ (Differentiation property)

Decoder : $1 + D$

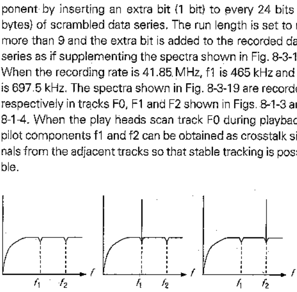
Transfer function : $(1/(1 - D^2) \cdot (1 - D^2) = 1$

The above shows that the input data and output data are identical also in expressions.

(B) 24/25 conversion

To gain advantage of the compatible playback with track linearity, the DV employs 24/25 conversion which turns the entire track into pilot signals.

The 24/25 conversion generates the low-frequency pilot component by inserting an extra bit (1 bit) to every 24 bits (3 bytes) of scrambled data series. The run length is set to no more than 9 and the extra bit is added to the recorded data series as if supplementing the spectra shown in Fig. 8-3-19. When the recording rate is 41.85 MHz, f1 is 465 kHz and f2 is 697.5 kHz. The spectra shown in Fig. 8-3-19 are recorded respectively in tracks F0, F1 and F2 shown in Figs. 8-1-3 and 8-1-4. When the play heads scan track F0 during playback, pilot components f1 and f2 can be obtained as crosstalk signals from the adjacent tracks so that stable tracking is possible.



Track F0 Track F1 Track F2

Fig. 8-3-19 Recording Signal Spectra

8.4 VIDEO/AUDIO SIGNAL PROCESSING IN PLAYBACK CIRCUITRY

For the playback signal processing in the initial stage at the head amp, equalizer and (1+D), see 8.3.10, "DCI".

8.4.1 Viterbi Decoding

This section describes the concept of Viterbi decoding.
Viterbi decoding is applicable only to the NRZI series signals. The decoding process of DV divides an interleaved NRZI series into two NRZI series and applies Viterbi decoding separately to each of them, then merges them later on to the original data series. Fig. 8-4-1 shows the concept of the basic principles of Viterbi decoding of NRZI series.

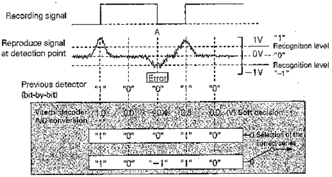

Recording signal
A
Reproduce signal at detection point
1V "1"
Recognition level
0V "0"
Recognition level
−1V "−1"
Error
Previous detector (bit-by-bit)
"1" "0" "0" "1" "0"
Viterbi decoder A/D conversion
1.0 0.0 −0.4 0.8 0.0 (V) Soft decision
"1" "0" "0" "1" "0"
"1" "0" "−1" "1" "0"
Selection of the correct series

Fig. 8-4-1 Viterbi Decoding

The differential waveform obtained by playing a NRZI-recorded tape is defined as the ID point for Viterbi decoding (point D in Fig. 8-3-18). The signal shown in Fig. 8-4-1 contains random noise. Previous processes (GR-DV1, etc.) without Viterbi decoding have been applying 3-value detection to this signal. In this case, errors may occur by judging the level at point A in Fig. 8-4-1 as "0" while it should be "-1". This technique is referred to as hard decision because it uses fixed identification levels.

On the other hand, Viterbi decoding uses a soft decision method. It first A/D converts the reproduce signal and reads the waveform level. For instance, if "1" is read as +1 V, "0" is read as 0 V, "-1" is read as -1 V and the level is -0.4, this leads to the judgment that the probability of being 0 is higher than that of being -1. Therefore, the bit series may be either 10010 or 10-110.
A decision criterion that "this is the recording/playback of NRZI series" is thus invoked. The differentiation waveform at the ID point of the reproduce waveform of NRZI series has the following rule.
The rule is that, when there are two positive-going waveforms, there is always a negative-going waveform between them. In other words, there is always "-1" between two "1" in the decoded value. This rule means that bit series 10010 above cannot exist, and bit series10-110 is selected.
As described above, the Viterbi decoding corrects errors by utilizing the rule between bits (redundancy of the NRZI series).

8.4.2 Error Correction

The DV corrects errors by decoding the data that has been coded using Reed-Solomon product codes. The minimum hamming distance of the product codes is d_1 and d_2 if the minimum hamming distances of C_1 and C_2 are d_1 and d_2, thus up to $(d_1d_2 - 1)/2$ errors can be corrected from the principles. Nevertheless, in fact, the maximum number of correctable errors is variable depending on the decoding technique. One of the decoding techniques is the series decoding technique that decodes C_1 first then decodes C_2. Although this is not the best way from the viewpoint of error correction capability, the serial connection of two decoders C_1 and C_2 makes it easy to build the hardware so it is used by many digital VCRs.
With a digital VCR, compound errors in which random errors and burst errors are mixed are produced (see Fig. 8-4-2).
Fig. 8-4-2 shows the correction of compound errors by product codes.

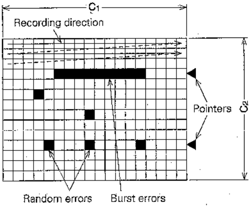


Fig. 8-4-2 Principles of Erasure Correction

Assume that the signal has been recorded in the direction of the arrow.
Decoding is applied in the common order, i.e. C_1 first, then C_2. With the C_1 decoding, pointers indicating random or burst errors beyond the correction capability are placed to all of the symbols of the code word containing the errors at the same time as random error correction. The symbols to which a pointer is attached are referred to as erasure symbols.
This decoding technique utilizing pointers is called the erasure correction, which features an improved error correction capability compared to the decoding techniques without pointers. In cases when a code error is ignored during C_1 decoding, a different code from the recorded code may be output by the C_2 decoding. This erroneous correction is one of the most important causes of video and audio quality deterioration. To prevent erroneous correction, the C_1 decoding prevents error detection mistakes by limiting the number of error corrections. Although the DV is capable of error correction of 2 symbols, the actual number of symbols subjected to error correction is limited to 1 by the RS code in $GF(2^8)$. This error correction limitation allows the error detection mistake probability to about $1/2^{16}$ of 2-symbol error correction. The error correction technique used in the C_2 decoding is variable depending on the number of erasure symbols.

(1) When the number of erasure symbols is 1 or less:
In this case, the use of a pointer cannot improve the error correction capability because only one error can be corrected. Therefore, the same 1-error correction and 2-error detection as the C1 decoding are used without using a pointer. An error that cannot be corrected by this technique is subject to error concealment, which will be described in section 8.4.3.

(2) When the number of erasure symbols is 2 or more:
Error detection is performed and, if errors are found in the locations with erasure symbols, error correction is also applied.
If errors are found in other locations than those with erasure symbols, the data is subjected to error concealment.

(3) When the number of erasure symbols is 3 or more:
In this case, error correction making a full use of the error correction capability is possible. However, as there is no error detection capability, error detection mistakes during C1 decoding will result in erroneous corrections.
To prevent this, verification is applied to see if each erasure symbol is right or wrong, and error correction is applied only when the number of right erasure symbols is no more than 2.
This erasure correction technique is referred to as a 2 out of 3, erasure correction.
When it is identified that code errors are found with all of the 3 errors, error concealment is applied by judging that code errors beyond the error correction capability have occurred.

(4) When the number of erasure symbols is 4 or more:
In this case, the erasure correction capability is exceeded so that error concealment is applied to prevent erroneous correction.

8.4.3 Error Concealment

Error concealment is a radically different technology from error correction.
Error correction technology restores errors to their original states by utilizing the relationship between the information part and the parity check part. However, error concealment makes errors less noticeable by complementing errors with the surrounding pixels. This means that error concealment can be applied only when there is a data correlation. The DV can employ error concealment because the video and audio signals are correlated between each other. The error concealment is particularly effective when there is a major scratch on the tape or when the reproduce error rate in slow, still or high-speed playback is too high to be handled by the error correction technology.
Error concealment is available by using more than one technique. For easy understanding, the techniques can be regarded as similar to the blemish compensation of still cameras or the dropout compensation (DOC) of VHS video.
Specifically, each data item containing an error is replaced with the data of 1 frame before using a frame memory.

8.4.4 De-shuffling (Audio)

The audio data, which has been shuffled before error correction, is de-shuffled and output as the audio signal.

8.4.5 VLD

The video data that has been shuffled before error correction is processed by VLD (Variable Length Decoding). This consists of decoding the signal that has been coded with VLC as described before.

8.4.6 I-DCT

After VLD, the data is processed by I-DCT (Inverse Discrete Cosine Transform) to expand the compressed data.

8.4.7 De-shuffling (Video)

The expanded data is de-shuffled to restore the video signal.

8.5 CAPSTAN SERVO

The rotation speed of the capstan motor is controlled in two ways; by velocity control or by ATF tracking.

8.5.1 Velocity Control

The capstan motor rotation speed is controlled according to the CAP FG pulse in the same way as the VHS video.

8.5.2 ATF Tracking

The capstan motor rotation speed is controlled based on pulses f_0, f_1 and f_2 that have been added by the 24/25 conversion, so that the crosstalk components from f_1 and f_2 are identical when track f_0 is traced.

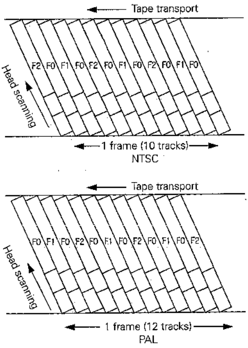

Tape transport
F2 F0 F1 F0 F2 F0 F1 F0 F2 F0 F1 F0
Head scanning
1 frame (10 tracks)
NTSC
Tape transport
F0 F1 F0 F2 F0 F1 F0 F2 F0 F1 F0 F2
Head scanning
1 frame (12 tracks)
PAL

Fig. 8-5-1

Assume that the 3 frequencies are respectively f0 = 0 Hz,
f1 = 465 kHz and f2 = 697.5 kHz.
CH1 always records f0, and CH2 records either f1 or f2. When the CH1 head traces the track during playback, the crosstalk components from the left and right tracks (tracks recorded for CH2) are always picked up because the head width is slightly wider than the track pitch. These crosstalk components are applied to the BPF for extracting the pilot signal frequency components, and the TREB waveform is generated by means of digital signal processing. (The point A in Fig. 8-5-2.)

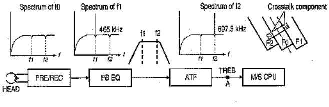

Spectrum of f0
f1 f2 f
Spectrum of f1
465 kHz
f1 f2 f
f1 f2
Spectrum of f2
697.5 kHz
f1 f2 f
Crosstalk component
F2 F0 F1
HEAD
PRE/REC
PB EQ
ATF
TREB
A
M/S CPU

Fig. 8-5-2

The TREB waveform indicates the CH1 tracking condition (see Fig. 8-5-3).

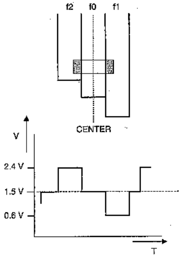

f2 f0 f1
CENTER
V
2.4 V
1.5 V
0.6 V
T

Fig. 8-5-3

Fig. 8-5-3 shows the TREB waveform when the CH1 head tracking is set to the center. Since the crosstalk components from the channels to the left and right are identical when the tracking is in the center, the levels of the pilot signals contained in them should also be identical. At this time, the DC voltage of TREB is 1.5 V.

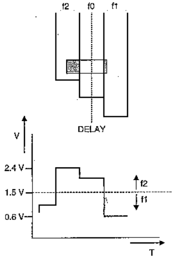

f2 f0 f1
DELAY
V
2.4 V
1.5 V
0.6 V
f2
f1
T

Fig. 8-5-4 TREB Waveform

Fig. 8-5-4 shows the TREB waveform when the CH1 head tracking is deviated toward the delay direction. As the crosstalk component from the track on the left (f2) is larger than that from the track on the right (f1) in this case, the pilot signal level of f2 is larger and the DC voltage of the TREB waveform tends to be located on the f2 side (higher than the center voltage). At this time, the upper limit of the variation range becomes 2.4 VDC (+ 0.9 V).

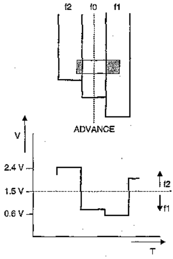

f2
f0
f1
ADVANCE
V
2.4 V
1.5 V
0.6 V
f2
f1
T

Fig. 8-5-5

Fig. 8-5-5 shows the TREB waveform when the CH1 head tracking is deviated toward the advance direction. As the crosstalk component from the track on the right (f2) is larger than that from the track on the left (f2) in this case, the pilot signal level of f2 is larger and the DC voltage of the TREB waveform tends to be located on the f1 side (lower than the center voltage). At this time, the lower limit of the variation range becomes 0.6 VDC (-0.9 V).

When a CH1 track is played, the tracking information is indicated by the DC voltage of TREB and is variable by ± 0.9 V according to the tracking error with respect to the 1.5 V DC which is the voltage in the center tracking condition. A change by 0.3 VDC corresponds to about 2μm. Also, when the CH2 head traces a track, pilot signal component f1 or f2 is maximized and the DC voltage of TREB becomes 2.4 V or 0.6 V.

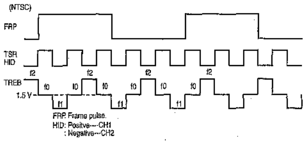

(NTSC)
FRP
TSR
HID
TREB
1.5 V
f2
f0
f1
FRP: Frame pulse.
HID: Positve---CH1
: Negative---CH2

Fig. 8-5-6

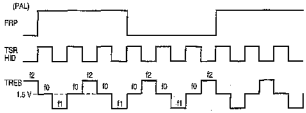

(PAL)
FRP
TSR
HID
TREB
1.5 V
f2
f0
f1

Fig. 8-5-7

Figs. 8-5-6 and 8-5-7 show the relationship between the FRP and HID waveforms and the TREB of NTSC and PAL respectively. With the NTSC signal, there are two kinds of order of pilot signals at the beginning of a frame; one is the order of f0 then f1, and the other is the order of f0 then f2. The former type of frame is called PF0 (pilot frame) and the latter type of frame is PF1. With the PAL signal, the pilot frame is always PF0 because it uses 12 tracks per frame. The position relationship between f1 and f2 in TREB is variable depending on the track number being played by the CH1 head. Therefore, the servo CPU should be aware of the currently played track number in the frame (see Figs. 8-5-8 and 8-5-9). The servo CPU identifies the track number by decoding 4 kinds of signals TRP0 to 2 and TSR output from the DCI (IC509) during playback. In actual operation, the track number of the previous track to the track being played (NTSC: 0 to 9, PAL: 0 to 11) is output at the edge of TSR.

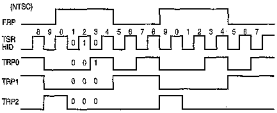

(NTSC)
FRP
TSR
HID
8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7
0 1 0
TRP0
0 0 1
TRP1
0 0 0
TRP2
0 0 0

Fig. 8-5-8

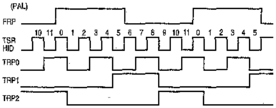

(PAL)
FRP
TSR
HID
10 11 0 1 2 3 4 5 6 7 8 9 10 11 0 1 2 3 4 5
TRP0
TRP1
TRP2

Fig. 8-5-9

8.6 DRUM SERVO

The rotation speed of the drum motor is controlled in two ways; the velocity control and the phase control.

8.6.1 Velocity Control

The drum motor rotation speed is controlled according to the Drum FG pulse in the same way as the VHS video.
The drum rotation speed should be:
NTSC : 149.85 [Hz]
PAL : 150 [Hz]

8.6.2 Phase Control

The phase control consists of the control of the start position of the track tracing by the head. This fine-adjusts the drum motor rotation speed according to the Drum PG pulse in the same way as the VHS video.
While the VHS generates the DFF pulse from the Drum PG pulse, the DV generates the HID (Head IDentity) pulse from the Drum PG pulse.

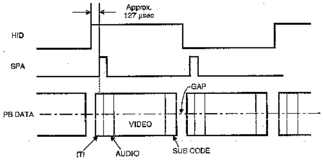


Fig. 8-6-1 PB Switching Point

The data recorded in a track includes ITI, Audio, Video, Sub-code, etc. When the DCI has detected 52 SBs (Sync Blocks) in the SSA (Start Sync Area) in ITI, it outputs the SPA signal to the servo CPU. The position of the SPA in a track is defined at about 127 μs from the edge of HID (which corresponds to the drum FF in previous video circuitry).
The PB switching point in the adjustment software adjusts the positioning automatically. Therefore, when adjusting the PB switching point, it is required to use an alignment tape in which track patterns are recorded precisely. If this adjustment is incorrect, the widths of the gaps before and after PB ENV may be variable, the sub-codes may not be reproduced correctly and the timecode may not function. The drum phase servo functions to align the drum PG rotation phase with the TSR produced by DCI. TSR has the same period (150 Hz) as HID but the timing is slightly different.

Table 8-6-1 shows the list of servo control signals.

		Speed Control	Phase Control	
			Reference signal.	Compare signal
DRUM		DRUM FG (900 Hz)	TSR	DRUM PG (150 Hz)
CAPSTAN	REC	CAPSTAN FG (897 Hz)	—	
	PB		1.5 VDC	TREB

Table 8-6-1 Servo Control Signal List

SECTION 9
CIRCUIT DESCRIPTION

9.1 CAMERA HEAD CIRCUITRY

9.1.1 Outline

The camera head with three 1/2-inch, 380,000-pixel CCDs and a signal processor block incorporating the same DSP (Digital Signal Processor) IC as that developed for the DY-90 transfers the signal captured with the camera to the mini-DV recorder block without spoiling the high video quality.
Most of the setting and adjustment items employ the EVR (Electric VR) system using menus to simplify the circuit design and improve the stability and reliability of adjustments.

9.1.2 IS and TG Boards

The CCDs are 1/2-inch, 380,000-pixel, IT type CCDs manufactured by Sony. These CCDs feature freedom from the Vsub adjustments, which used to be necessary with previous CCDs. This design also freed the CCDs from troubles such as insufficiency in dynamic level or lack of color due to adjustment errors after a CCD block assembly replacement.

(1) IS board

Each of the IS boards carry the CCD (IC501) and sample-and-hold IC (IC503). The IS board of this unit does not carry the VCA (Voltage Control Amplifier) which is mounted with the DY-90.
With this unit, the VCA is located in the video signal processor block on the CAM1 board.

(2) TG board

The vertical drive pulse is obtained from the V Driver of MN3112SA (ICs 2, 3, 4) based on the drive signals generated by the TG (Timing Generator) IC1. The horizontal drive pulse is obtained from 74VHC08 (ICs 6, 7).
The TG IC itself is compatible with both NTSC and PAL, and detects the signal format by the processing of pin 14. The IC operates for NTSC when pin 14 is Open and for PAL when pin 14 is pulled up by R1.
The R/G/B video signals from the IS boards are input through CN11 (19), CN12 (19) and CN13 (19). These signals are not processed in this board but output at pins 2 to 6 of CN4 to the CAM1 board.

9.1.3 CAM1 Board

The CAM1 board includes the analog signal processor circuitry and microcomputer circuitry.
The ROM (IC901) mounting the microcomputer software is not located on the CAM1 board but on a sub-board called the ROM board, which is connected to CN24. The DIP switch (S901) used in settings is also located on the ROM board.
The circuit diagram of this board is separated into two sections. The diagram on page 1/2 (in Fig. 9-1-2) shows the microcomputer circuitry and that on page 2/2 (in Fig. 9-1-3) shows the signal processor circuitry.

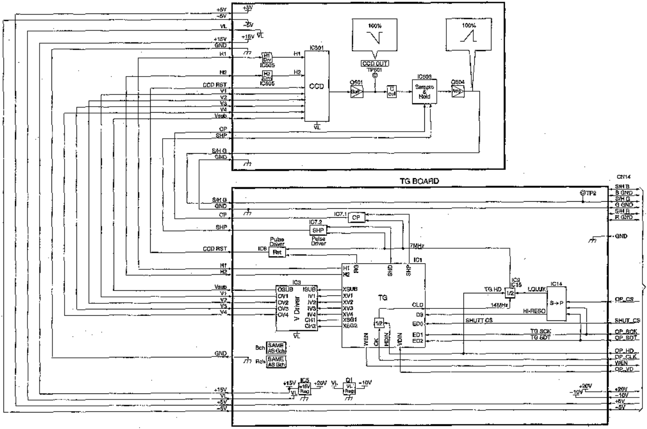

IS BOARD
+5V
-5V
VL
+15V
GND
H1
H2
CCD RST
V1
V2
V3
V4
Vsub
CP
SHP
S/H G
GND
H1 Drv
IC505
H2 Drv
IC505
IC501
CCD
100%
CCD OUT
TP501
Q501
Buff
C cut
IC503
Sample & Hold
Q504
Amp
TG BOARD
CN14
S/H B
B GND
S/H G
G GND
S/H R
R GND
TP2
GND
IC7.1
CP
IC7.2
SHP
Pulse Driver
IC6
Rst
7MHz
IC1
RG
SHD
TG
IC3
OSUB
ISUB
OV1
OV2
OV3
OV4
IV1
IV2
IV3
IV4
CH1
CH2
V Driver
XSUB
XV1
XV2
XV3
XV4
XSG1
XSG2
CLD
D9
ED0
ED1
ED2
WEN
CK
HDIN
VDIN
1/2
IC9
IC15
TG HD
LOLUK
14MHz
IC14
S→P
HI-RESO
SHUTT CS
TG SCK
TG SDT
FROM/TO CAM1 CN14
OP_CS
SHUT_CS
OP_SCK
OP_SDT
OP_HD
OP_CLK
WEN
OP_VD
Bch
Rch
SAME AS Gch
IC5
+15V Reg
+20V
Q1
VL Reg
-10V
+20V
-10V
+5V
-5V

Fig. 9-1-1

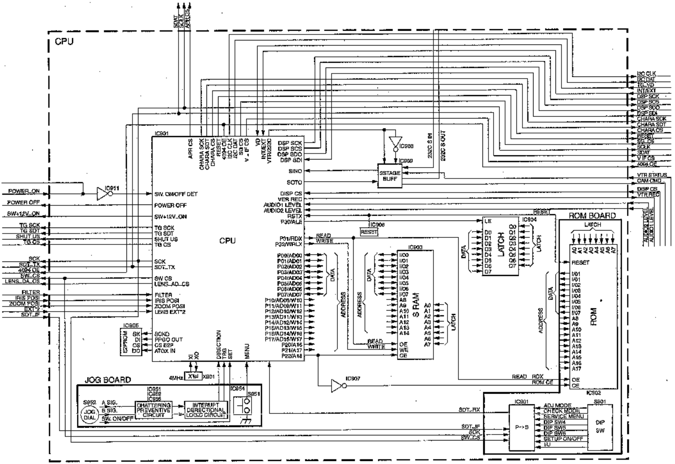

CPU
IC901
IC911
IC905
E2PROM
IC906
IC907
IC908
IC909
3STAGE BUFF
IC903
S RAM
IC904
LATCH
ROM BOARD
IC902
ROM
IC801
P->S
S801
DIP SW
JOG BOARD
S952
JOG DIAL
CHATTERING PREVENTIVE CIRCUIT
INTERUPT DERECTIONAL LOGIC CIRCUIT
IC954
S951
X901
4MHz
POWER_ON
POWER OFF
SW+12V_ON
TG SCK
TG SDT
SHUT US
TG CS
SCK
SDT_TX
4094 OE
SW_CS
LENS_DA_CS
FILTER
IRIS POSI
ZOOM POSI
EXT 2
SDT_IF
I2C CLK
I2C DAT
TG_VD
INT/EXT
DSP SCK
DSP SCS
DSP SDO
DSP SDI
CHARA SCK
CHARA SDT
CHARA CS
RESET
SG_CS
SCLK
SDAT
V IF CS
4094 OE
VTR STATUS
CAM CMD
DISP CS
VTR REC
AUDIO2 LEVEL
AUDIO1 LEVEL
READ
WRITE
DATA
ADDRESS
ADJ MODE
CHECK MODE
SERVICE MENU
DIP SW4
DIP SW5
DIP SW6
SETUP ON/OFF
I/U
SDT_RX

Fig. 9-1-2

The microcomputer circuitry shown on page 1/2 (in Fig. 9-1-2) is more simplified than previous circuits. Inputs from most switches are directly input to the CPU ports, making it unnecessary to use an IC for parallel to serial conversion of inputs. The character generator IC and associated circuitry are mounted on the CAM2 board.

About 1/3 of the circuit diagram on page 2/2 (in Fig. 9-1-3) is occupied by the EVR circuitry, which combines the IC526 (MB88345) outputs into three control signals and sends them to their respective control circuitry.

The other part of the diagram is occupied by the signal processor circuitry, which receives the control signals from the EVR circuitry and performs basic processing of the video signals. Two analog switches (ICs 511, 514) in the middle are provided for use in switching the LOLUX filtered signals.

Analog switch IC516 is used for blanking processing (0 V).

TPs 403, 503 and 603 on this board are the points to check the properly controlled white balance of the R/G/B signals.

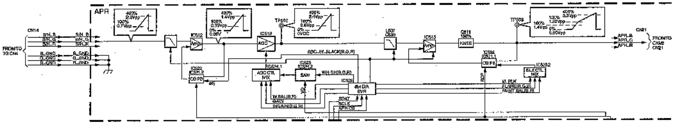

APR
CN14
FROM/TO TG CN4
S/H_B
S/H_G
S/H_R
B_GND
G_GND
R_GND
IC512
IC513
AGC
TP502
IC522
IC521.2
OB PD
IC524.1
AGC CTL MIX
IC525
IC521.3
SW
IC526
8bit D/A EVR
IC515
IC511
KNEE
TP503
IC522
IC521.1
OB FB
IC5292
BLK CTL MIX
CN21
APR_B
APR_G
APR_R
FROM/TO CAM2 CN21
SDAT
SCLK
APR CS

Fig. 9-1-3

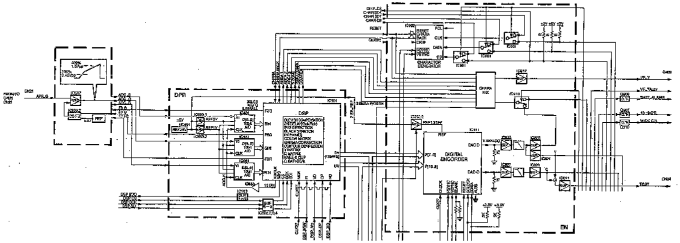
9.1.4 CAM2 Board

The circuit diagram of this board is separated into three sections.

(1) The diagram on page 1/3 shows the major input/output connectors of the board.
CN21 is connected to the CAM1 board, and its pins 6, 8 and 10 input analog R/G/B signals. These signals are subjected to digital signal processing by the circuitry shown on page 2/3.
60-pin connectors CN1 and CN2 are board-to-board connectors for connection with the DV MAIN board.
The amplifier circuitry for the microphone installed on the camera head is shown in the center of the diagram.
This circuitry includes the amp which amplifies the -60 dB balanced input to -20 dB and the circuit supplying the phantom power (+48 V) (ON/OFF switchable).

(2) The diagram on page 2/3 shows the DSP (Digital Signal Processor) IC for major processing operations of camera signals and the associated circuitry.
The R/G/B signals are input in analog, converted into digital by the 10-bit A/D converter ICs (IC481, 581, 681) then input to the camera DSP (IC801).
The DSP's signal level comparator for black lock compares the value of the signal input to the DSP to see if they are more or less than 32 (dec). The results are returned as the black locking feedback signals (FBR, FBG, FBB). These signals are then integrated by IC623.1/2 and IC423.2, and the result is mixed with the A/D input signal for use in the black position adjustment.
The Y and U/V signals output from the DSP are supplied to the D/A converter IC (IC811) for conversion into the analog luminance (Y) and chrominance (C) signals, which are used in TEST OUT, VIDEO OUT, etc. At the same time, these signals are also output as the signals to the DV MAIN board.

(3) The diagram on page 3/3 corresponds to the SSG circuitry. It outputs sync signals from SSG IC IC102 (XC95144X10T).



FROM/TO CAM1 CN21
CN21
APR.G
IC537
REF
DPR
IC801
DSP
FBB
BIN
FBG
GIN
FBR
RIN
REF2V
REF1V
IC481
IC581
IC681
10bit A/D
CLK
REF2.5V
IC102
BUF
DSP_SDO
DSP_CS
DSP_SCK
DSP_SDI
CLK27
DSP_VD
DSP_HD
CHARACTOR GENERATOR
IC902
RESET
CLK
DATA
CS
HSYNC
VSYNC
IC901
CHARA MIX
IC910
VF_Y
VF_TALLY
BATT_ALARM
16:9 CTL
WIDE CTL
IC811
DIGITAL ENCORDER
REF
DAC D
DAC C
Y ANALOG
Y
C
TEST
CN34
EN

Fig. 9-1-4

9.2 DV CIRCUIT

The DV MAIN board performs all video and audio processing operations of the DV format. The video from the camera is input to the DVIO IC (IC602) which acts as an interface between the camera head and recorder. With the DVIO used with the BR-DV600, the analog input signals are input directly, and then input to the CAS IC (IC301). As the name of CAS (Compression, Audio, Shuffle) implies, the CAS IC performs compression of DCT/VLC, input of audio signal into the sync block and the shuffling of video signal with a single IC. The output signal is then input to the EDA IC (IC303). EDA stands for ECC (Error Correction Code), DCI (Digital Channel Interface) and ATF (Auto Tracking Function), and the IC incorporates these three functions in a single IC. After the parity addition using the ECC and conversion into recording signal have completed in this IC, the recording signal output from the EDA IC is input to the P/R & MDA boards and fed to the recording heads through the recording amp. Only two heads are mounted on the drum and the DV uses neither a flying erase head nor full erase head. This is because of the overlapped recording capability of digital recording thanks to the use of very high recording frequency and the concentration of recording magnetic flux in the upper part of magnetic layer. Overwriting a signal results in complete erasure of the original signal on the videotape.

The DV MAIN board has two CPUs, the DV CPU and MSD CPU. The DV CPU functions as the master and the MSD CPU functions as the slave. The DV CPU controls the EVR, communicates with the service tool connector and is also connected with the System CPU on the VIDEO/SYSCON board through a JVC bus. The MSD CPU is a microcomputer controlling the mechanism controller, servo and Digital IF IC (IC801).

The Digital IF IC (IC801) is the interface IC for the DV terminal inputs/outputs. IC201 is the Audio ADC/DAC IC, which during recording converts the analog audio signals from the Audio/LCD board to a digital signal and supplies it to the CAS IC located behind IC801, and during playback converts the digital signals into analog signals and supplies them to the Audio/LCD board.

9.2.1 Input Camera Video Signals

The video signals from the camera are supplied to the recorder circuitry in the digital format. They are not converted to analog signals to avoid video quality deterioration. The signals output from the camera DSP take the 4:2:2 format video data (Y: 8 bits, R-Y/B-Y: 8 bits, 13.5 MHz) and output from CAM2 board IC801 through DY(1) to DY(8) for the Y signal and UV(1) to UV(8) for the C (Cr/Cb) signal. The R-Y/B-Y signals are output alternately in linear sequence. The CAM CLK, INV and INH signals are also output together with the video signals. Fig. 9-2-2 shows these signals. CAMCLK is not 13.5 MHz but counted down to 4.5 MHz before being output. The INH and INV signals use the H and V timing signals for indicating the start of the data signal (see Figs. 9-2-3 and 9-2-4). The Y/C video data signals are sent through buffer ICs 828 and 829 on the CAM2 board, input to the DV MAIN board where they are formatted into the DV format signals. They are also supplied to the D/A converter in IC811 and output as the Y and chroma signals, which are input to IC5 on the VIDEO/SYSCON board. IC5 also inputs the PB Y and PB C signals from the recorder and the switching between the camera output and recorder playback output is performed here.

9.2.2 Digital Video Signal Compression

The signals supplied from the camera head to the recorder consist only of the effective video signals without the blanking signal. It is an 8-bit signal sampled at 13.5 MHz, and has 720 horizontal pixels and 480 vertical lines (PAL: 576 lines). The data rate per second is as shown below.

NTSC : 720(H) x 480(V) x 2(Y&C) x 8(bits) x 30 (frames) ≒ 166 Mbps
PAL : 810(H) x 576(V) x 2(Y&C) x 8(bits) x 25(frames) ≒166 Mbps

In the DVIO IC, this signal is converted from 4:2:2 to 4:1:1 to reduce the data quantity to 124 Mbps. It is then compressed to 1/5 by the DCT/VLC in the CAS IC and the data quantity becomes about 25 Mbps. This compressed signal is the DV format signal of the DV standard. It can be interfaced with other components through the DV terminal (IEEE1394 compliant).

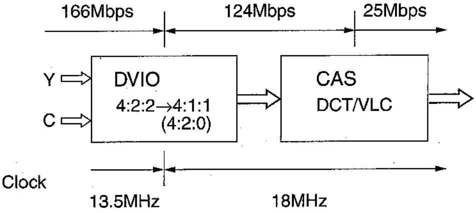


Fig. 9-2-1

Digital Video Data of DV

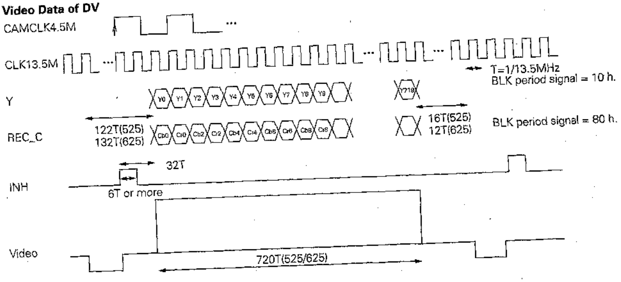

CAMCLK4.5M
CLK13.5M
T=1/13.5MHz
BLK period signal = 10 h.
Y
Y0
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y719
16T(525)
12T(625)
BLK period signal = 80 h.
REC_C
122T(525)
132T(625)
Cb0
Cr0
Cb2
Cr2
Cb4
Cr4
Cb6
Cr6
Cb8
Cr8
32T
INH
6T or more
Video
720T(525/625)

Fig. 9-2-2 Input Data

①NTSC (Effective lines: 23 ~ 262, 285 ~ 524)

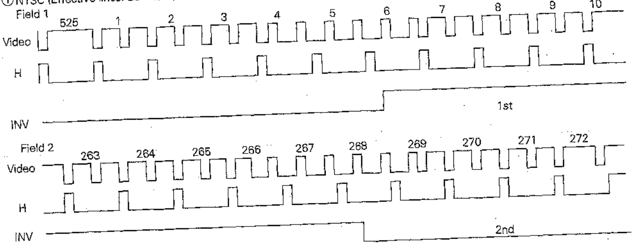

Field 1
525
1
2
3
4
5
6
7
8
9
10
Video
H
1st
INV
Field 2
263
264
265
266
267
268
269
270
271
272
Video
H
2nd
INV

Fig. 9-2-3 H/V Timings (NTSC)

②PAL (Effective lines: 23 ~ 310, 335 ~ 622)

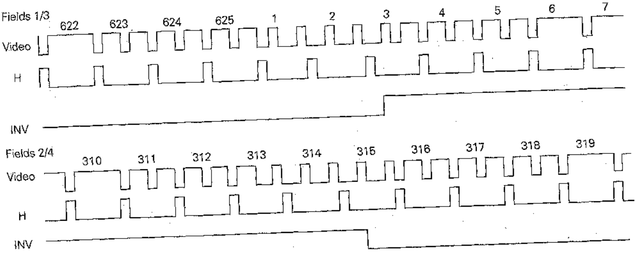

Fields 1/3
622
623
624
625
1
2
3
4
5
6
7
Video
H
INV
Fields 2/4
310
311
312
313
314
315
316
317
318
319
Video
H
INV

Fig. 9-2-4 H/V Timings (PAL)

9.2.3 DVIO (IC602)

The digital video signals supplied to the DV MAIN board are input to pins 110 to 117 (Y signal), pins 99 to 106 (C signal), pin 98 (CAM CLK), pin 118 (INH) and pin 119 (INV). The 4:2:2 format video data from the camera (Y: 8 bits, Cr/Cb: 8 bits, 13.5 MHz) is converted into the 4:1:1 (4:2:0 with PAL) format (Y/C: 8 bits, 18 MHz) data, which is output at pins 68 to 75 toward the Shuffle Memory IC.

With the BR-DV600, the analog Y/C signals output from the AGC are input. The analog video signals are input directly through pin 157 (Y signal) and pin 165 (C signal) and converted by two A/D converters on the board. The signal obtained by the sync separation of the input is input to pin 156, then subjected to the extraction of effective video area signals by eliminating the sync components. The subsequent processing is identical to the above.

During playback, the DV data in the 4:1:1 (4:2:0 with PAL) format is converted into the internal data of the 4:2:2 format and supplied to the analog video output circuitry. The analog output circuitry has 4 separate D/A converters for Y, C, Cr and Cb. The sync components are added to the Y signal and the encoder and burst addition functions are provided for the C signal.

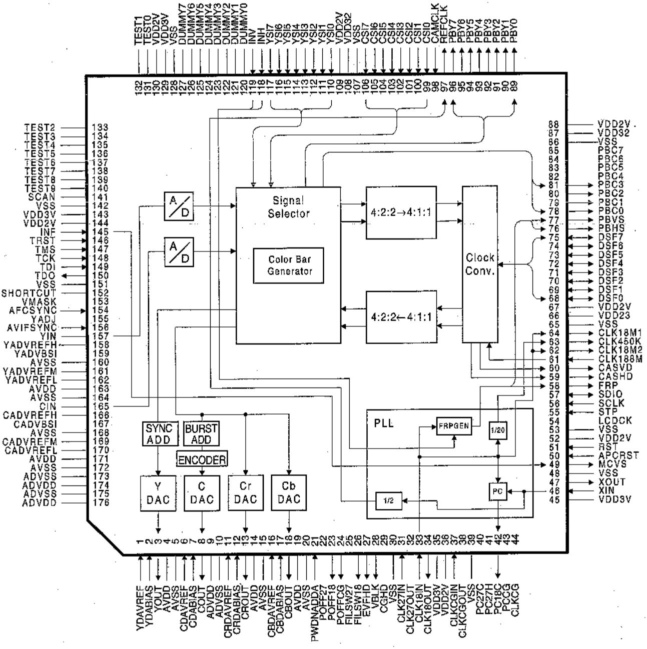

TEST1 132
TEST0 131
VDD2V 130
VDD3V 129
VSS 128
DUMMY7 127
DUMMY6 126
DUMMY5 125
DUMMY4 124
DUMMY3 123
DUMMY2 122
DUMMY1 121
DUMMY0 120
INV 119
INH 118
YSI7 117
YSI6 116
YSI5 115
YSI4 114
YSI3 113
YSI2 112
YSI1 111
YSI0 110
VDD2V 109
VDD32 108
VSS 107
CSI7 106
CSI6 105
CSI5 104
CSI4 103
CSI3 102
CSI2 101
CSI1 100
CSI0 99
CAMCLK 98
REFCLK 97
PBY7 96
PBY6 95
PBY5 94
PBY4 93
PBY3 92
PBY2 91
PBY1 90
PBY0 89
TEST2 133
TEST3 134
TEST4 135
TEST5 136
TEST6 137
TEST7 138
TEST8 139
TEST9 140
SCAN 141
VSS 142
VDD3V 143
VDD2V 144
INF 145
TRST 146
TMS 147
TCK 148
TDI 149
TDO 150
VSS 151
SHORTCUT 152
VMASK 153
AFCSYNC 154
YADJ 155
AVIFSYNC 156
YIN 157
YADVREFH 158
YADVBSI 159
AVSS 160
YADVREFM 161
YADVREFL 162
AVDD 163
AVSS 164
CIN 165
CADVREFH 166
CADVBSI 167
AVSS 168
CADVREFM 169
CADVREFL 170
AVDD 171
AVSS 172
ADVSS 173
ADVDD 174
ADVSS 175
ADVDD 176
88 VDD2V
87 VDD32
86 VSS
85 PBC7
84 PBC6
83 PBC5
82 PBC4
81 PBC3
80 PBC2
79 PBC1
78 PBC0
77 PBVS
76 PBHS
75 DSF7
74 DSF6
73 DSF5
72 DSF4
71 DSF3
70 DSF2
69 DSF1
68 DSF0
67 VDD2V
66 VDD23
65 VSS
64 CLK18M1
63 CLK450K
62 CLK18M2
61 CLK188M
60 CASVD
59 CASHD
58 FRP
57 SDIO
56 SCLK
55 STP
54 LCDCK
53 VSS
52 VDD2V
51 RST
50 APCRST
49 MCVS
48 VSS
47 XOUT
46 XIN
45 VDD3V
A/D
A/D
Signal Selector
Color Bar Generator
4:2:2→4:1:1
4:2:2←4:1:1
Clock Conv.
PLL
FRPGEN
1/20
PC
1/2
SYNC ADD
BURST ADD
ENCODER
Y DAC
C DAC
Cr DAC
Cb DAC
1 YDAVREF
2 YDABIAS
3 YOUT
4 AVDD
5 AVSS
6 CDAVREF
7 CDABIAS
8 COUT
9 ADVDD
10 ADVSS
11 CRDAVREF
12 CRDABIAS
13 CROUT
14 AVDD
15 AVSS
16 CBDAVREF
17 CBDABIAS
18 CBOUT
19 AVDD
20 AVSS
21 PWDNADDA
22 POFF27
23 POFF18
24 POFFCG
25 FILSW27
26 FILSW18
27 EVFHD
28 VBLK
29 CGHD
30 VSS
31 CLK27IN
32 CLK27OUT
33 CLK18IN
34 CLK18OUT
35 VDD3V
36 VDD2V
37 CLKCGIN
38 CLKCGOUT
39 VSS
40 PC27C
41 PC27H
42 PC18C
43 PCCG
44 CLKCG

Fig. 9-2-5

9.2.4 PLL Operation

The DVIO IC has two PLL circuits, for 18 MHz and 27 MHz. The 18 MHz signal is the reference clock of the DV circuitry and the 27 MHz signal is used as the standard clock for the internal signal processing by the DVIO IC. First, the configuration of the 18 MHz PLL.

With camera video recording of the GY-DV500, the switch in PLL IC601 is set to the pin 33 input in both record and play modes. At this time, the reference signal is set to CAM IN by a switch in the DVIO IC and locked to CAM CLK.

With the DV terminal input signal (IEEE1394) or the analog input of the BR-DV600, the switch in the PLL IC is set to 1394REC. At this time, the 18 MHz clock is locked with the frame pulse of the DV input (receive) signal from the digital IF (IC801). The PC (Phase Comparator) used is located in the MSD IC (IC401).

The analog input is synchronized with AFC SYNC obtained by sync separation by the switch in the DVIO IC. For the reference signals of the PLL operations, see Table 9-2-1.

The 18 MHz reference clock is output at pin 62 of IC602 as CLK18M1 to the Shuffle Memory (IC302), and at pin 64 as CLK18M2 to the CAS (IC301), EDA (IC303) and digital IF (IC801). The 450 Hz signal obtained by dividing the clock is output at pin 63 as CLK450K to the PC of EDA (IC303) and used as the reference for recording clock VCO.

Now let us see the configuration of the 27 MHz PLL. When CAM IN is set, the video data signal is input to the DVIO IC at the timing of 27 MHz. As it is necessary to generate 27 MHz from CAM CLK in the PLL circuit, the signal is generated by the VCO in IC601. The reference signal becomes CAM CLK.

With recording of the DV terminal input signal or the analog terminal input signal, the crystal oscillators attached to the DVIO IC, X602 (27 MHz) and X603 (26.995 MHz) are used. X603 is used only when recording of analog input (see Table 9-2-1).

(Note) The DV terminal of the GY-D500E does not have a signal input function.

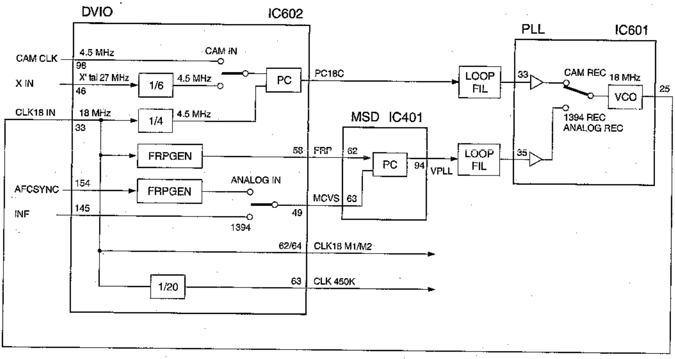

DVIO
IC602
CAM CLK
4.5 MHz
CAM IN
98
X IN
X' tal 27 MHz
46
1/6
4.5 MHz
PC
PC18C
CLK18 IN
18 MHz
33
1/4
4.5 MHz
FRPGEN
58
FRP
AFCSYNC
154
FRPGEN
ANALOG IN
MCVS
INF
145
49
1394
62/64
CLK18 M1/M2
1/20
63
CLK 450K
MSD IC401
62
PC
94
VPLL
63
LOOP FIL
LOOP FIL
PLL
IC601
33
CAM REC
18 MHz
VCO
25
1394 REC
ANALOG REC
35

Fig. 9-2-6 Configuration of 18 MHz PLL

Input	18 MHz		27 MHz	
	Record	Play	Record	Play
CAM IN (GY-DV500)	CAM CLK	CAM CLK	CAM CLK	CAM CLK
IEEE1394	INF (IC801)	INF (IC801)	27 MHz (X602)	27 MHz (X602)
ANALOG IN (BR-DV600)	AFC SYNC	Crystal 27MHz	26. 995 MHz (X603)	27 MHz (X602)

Table 9-2-1 PLL Reference Signals

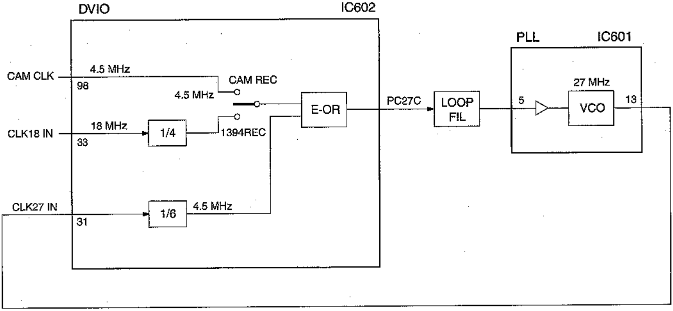

DVIO
IC602
PLL
IC601
CAM CLK
4.5 MHz
98
CAM REC
4.5 MHz
CLK18 IN
18 MHz
33
1/4
1394REC
E-OR
PC27C
LOOP FIL
5
27 MHz
VCO
13
CLK27 IN
31
1/6
4.5 MHz

Fig. 9-2-7 Configuration of 27 MHz PLL

Mode Switching

IC601 can be set to the 18 MHz PLL mode using pins 29 and 30.

	㉙	㉚
㉝ PB/CAMERA REC	H	L
㉟ 1394 REC	L	H
Power Save	L	L

Table 9-2-2 Mode Setting Table

9.2.5 CAS (Compression/Audio/Shuffle)

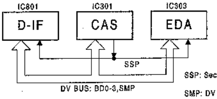
IC301 executes digital signal processing for providing the video and audio signals with compliance with the DV format. Its built-in functions include compression, shuffling (respectively decompression and deshuffling in playback) and audio processing.

In recording, the CAS IC performs shuffling of the video signal by the Shuffle Memory address read/write enable control. It them processes the video data with discrete cosine transform (DCT), quantization and variable length coding (VLC) and sync block storage, and outputs the data to the DV bus.

The processing in playback is reverse to that in recording. The CAS IC extracts the video sync block data and audio sync block data from the DV bus and decodes the video and audio data from them.

The IC incorporates an audio clock PLL for synchronization of audio signal with the video signal.

It also incorporates the audio muting/fading function with the V-fade capability, which fades out or in the audio before and after an edit point based on the edit point information recorded on tape.


IC801
D-IF
IC301
CAS
IC303
EDA
SSP
DV BUS: BD0-3,SMP

SSP: Sector(1-track) Start/Stop Pulse

SMP: DV BUS Start Mark Pulse

Fig. 9-2-8 DV Bus Connection

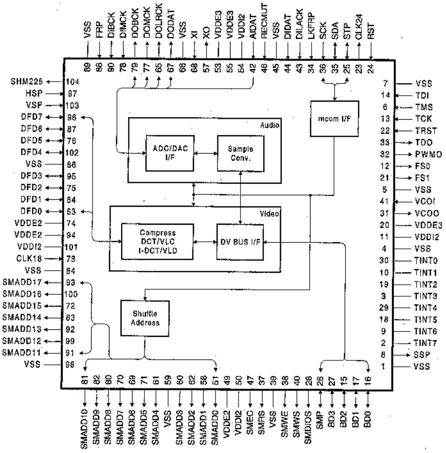

VSS 89
FRP 88
DIBCK 90
DIMCK 78
DOBCK 79
DOMCK 77
DOLRCK 65
DODAT 67
VSS 66
XI 68
XO 57
VDDE3 53
VDDE3 55
VDDI2 54
AIDAT 42
RECMUT 46
VSS 45
DIDAT 44
DILACK 43
LKFRP 34
SCK 36
SDA 35
STP 25
CLK24 23
RST 24
SHM225 104
HSP 97
VSP 103
DFD7 96
DFD6 87
DFD5 76
DFD4 102
VSS 86
DFD3 95
DFD2 75
DFD1 64
DFD0 63
VDDE2 74
VDDE2 94
VDDI2 101
CLK18 73
VSS 84
SMADD17 93
SMADD16 100
SMADD15 72
SMADD14 83
SMADD13 92
SMADD12 99
SMADD11 91
VSS 98
7 VSS
14 TDI
6 TMS
13 TCK
22 TRST
33 TDO
32 PWMO
12 FS0
21 FS1
5 VSS
41 VCOI
31 VCOO
20 VDDE3
11 VDDI2
4 VSS
30 TINT0
10 TINT1
19 TINT2
3 TINT3
29 TINT4
18 TINT5
9 TINT6
2 TINT7
8 SSP
1 VSS
81 SMADD10
82 SMADD9
80 SMADD8
70 SMADD7
69 SMADD6
71 SMADD5
61 SMADD4
59 VSS
60 SMADD3
62 SMADD2
58 SMADD1
51 SMADD0
49 VDDE2
50 VDDI2
47 SMEC
37 SMRS
39 VSS
38 SMWE
40 SMWS
28 SMDIOS
26 SMP
27 BD3
15 BD2
17 BD1
16 BD0
Audio
ADC/DAC I/F
Sample Conv.
mcom I/F
Video
Compress DCT/VLC I-DCT/VLD
DV BUS I/F
Shuffle Address

Fig. 9-2-9 Pin Layout of CAS IC301

9.2.6 Audio PLL Operation

The audio clocks include DOMCK, DOBCLK and DOLRCLK. The PLL circuits generating these clocks are IC307, IC306 (recording circuitry) and IC601 (playback circuitry).
The 265Fs audio master clock is generated from CLK18M of the video circuitry. The Audio PLL also manages the number of audio data items to be inserted in 1 frame of video data in order to lock the video and audio.

NTSC (525/60) operation
The number of samples per frame is not an integer in the 48 kHz mode because 48 kHz/30 (1000/1001) Hz = 1601.6. Therefore, the number of samples is assigned per 5 frames as shown below.

1st frame :1600 samples
2nd to 5th frames: 1602 samples
As the number of samples becomes 8008 per 5 frames, the audio can be locked with the video.

PAL (625/50) operation
The number of samples per frame becomes an integer because 48 kHz/25 Hz = 1920. Audio samples are simply recorded 1920 samples per frame.

The number of audio samples per frame is recorded in AUDIO AUX, and the master clock control during playback is performed based on the sample count information.

The PLL operation in recording starts with the generation of the 24.576 MHz CLK for use as the basis of the FS CLK by IC307 and IC306. Video clock CLK18M is input to IC307 which generates 27 MHz from it. Then, IC306 generates 24.576 MHz which is supplied to the CAS IC. As DOMCK is equal to 256Fs, it is 12.288 MHz in the 48K mode. DOMCK is divided to obtain DOBCLK and DOLRCK.

In playback, the FS CLK is generated by the VCO in IC601 based on FRP. The VCO can vary the clock frequency according to the mode selection (48K/41.1K/32K modes). The FS CLK is fed back to PWMO GEN in the CAS IC so that it is locked permanently with the video clocks.

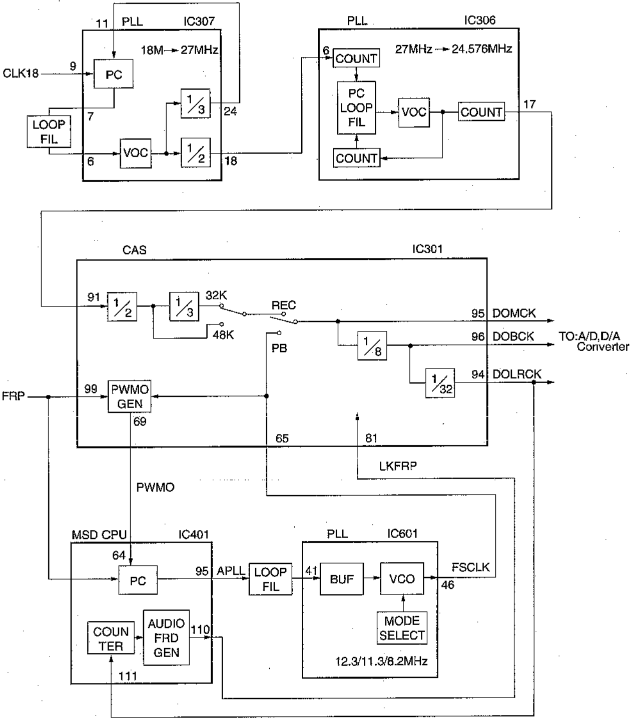

11
PLL
IC307
18M→27MHz
CLK18
9
PC
7
LOOP FIL
6
VOC
1/3
24
1/2
18
PLL
IC306
27MHz→24.576MHz
6
COUNT
PC LOOP FIL
VOC
COUNT
17
COUNT
CAS
IC301
91
1/2
1/3
32K
REC
48K
PB
95
DOMCK
1/8
96
DOBCK
TO:A/D,D/A Converter
1/32
94
DOLRCK
FRP
99
PWMO GEN
69
65
81
LKFRP
PWMO
MSD CPU
IC401
64
PC
95
APLL
LOOP FIL
PLL
IC601
41
BUF
VCO
FSCLK
46
MODE SELECT
12.3/11.3/8.2MHz
COUN TER
AUDIO FRD GEN
110
111

Fig. 9-2-10 Audio PLL

Mode Switching

The mode of the audio FS PLL in IC601 can be set using pins 39 and 40.

		㊵	㊴
㊻ FSCLK	12.3M(48K)	H	L
	11.3M(44.1K)	L	L
	8.2M(32K)	H	H

Table 9-2-3 Mode Setting Table

9.2.7 EDA (ECC/DCI/ATF)

IC303 executes ECC (Error Correction Code) processing, DCI (Digital Channel Interface) modulation/demodulation processing, ATF (Auto Tracking Function) error detection, head switch signal generation, viterbi decoding and clock phase correction.

In recording, the EDA IC receives the audio and video data from the DV bus and AUX and SUB CODE data (TIME CODE) from the MSD microcomputer (IC401), applies ECC and SI-NRZI/24-25 conversion, generates the recorded signal and outputs it to the REC amp.

In playback, the IC processes the PB signal from the PB equalizer with viterbi decoding, extracts the sync blocks and performs correction with ECC decoding. After this, the IC outputs the audio and video data to the DV bus and the AUX and SUB CODE data to the MSD microcomputer.

- ATFDET

  Detects errors for ATF in the DV format, and sends the results to the MSD I/F.

  The ATF signal extracted by PB EQ (IC501) is input from pin 48 and digitized by the 8-bit A/D converter.
- HID CTL

  Generates and outputs the head switching signal (HID).
- Viterbi

  The A/D converted 7-bit data for the viterbi detection circuit is input. See 9.2.8, "PB Equalizer".

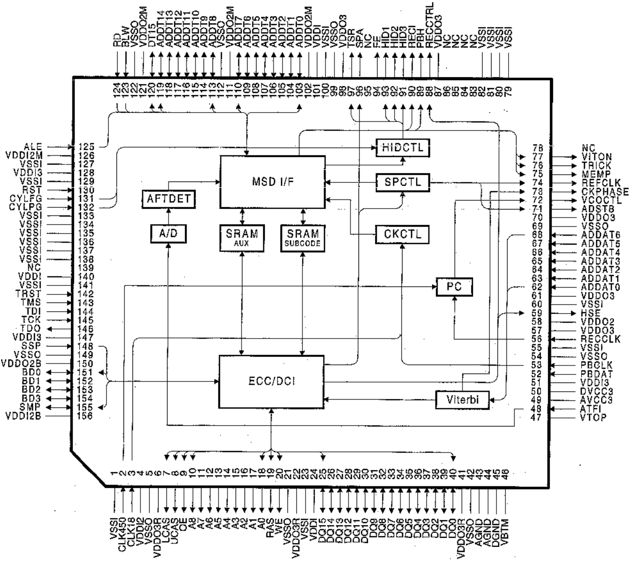
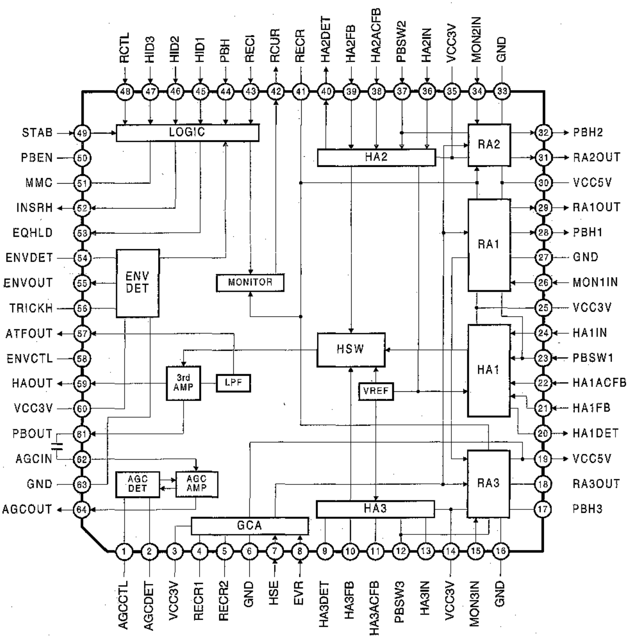

MSD I/F
HIDCTL
SPCTL
CKCTL
AFTDET
A/D
SRAM AUX
SRAM SUBCODE
PC
ECC/DCI
Viterbi
124 RD
123 BLW
122 VSSO
121 VDDO2M
120 DT15
119 ADDT14
118 ADDT13
117 ADDT12
116 ADDT11
115 ADDT10
114 ADDT9
113 ADDT8
112 VSSO
111 VDDO2M
110 ADDT7
109 ADDT6
108 ADDT5
107 ADDT4
106 ADDT3
105 ADDT2
104 ADDT1
103 ADDT0
102 VDDO2M
101 VDDI
100 VSSI
99 VSSO
98 VDDO3
97 TSR
96 SPA
95 NC
94 FE
93 HID1
92 HID2
91 HID3
90 RECI
89 PBH
88 RECCTRL
87 VDDO3
86 NC
85 NC
84 NC
83 NC
82 VSSI
81 VSSI
80 VSSI
79 VSSI
125 ALE
126 VDDI2M
127 VSSI
128 VDDI3
129 VSSI
130 RST
131 CYLFG
132 CYLPG
133 VSSI
134 VSSI
135 VSSI
136 VSSI
137 VSSI
138 VSSI
139 NC
140 VDDI
141 VSSI
142 TRST
143 TMS
144 TDI
145 TCK
146 TDO
147 VDDI3
148 SSP
149 VSSO
150 VDDO2B
151 BD0
152 BD1
153 BD2
154 BD3
155 SMP
156 VDDI2B
78 NC
77 VITON
76 TRICK
75 MEMP
74 REFCLK
73 CKPHASE
72 VCOCTL
71 ADSTB
70 VDDO3
69 VSSO
68 ADDAT6
67 ADDAT5
66 ADDAT4
65 ADDAT3
64 ADDAT2
63 ADDAT1
62 ADDAT0
61 VDDO3
60 VSSI
59 HSE
58 VDDO2
57 VDDO3
56 RECCLK
55 VSSI
54 VSSO
53 PBCLK
52 PBDAT
51 VDDI3
50 DVCC3
49 AVCC3
48 ATFI
47 VTOP
1 VSSI
2 CLK450
3 CLK18
4 VDDI2
5 VSSO
6 VDDO3R
7 LCAS
8 UCAS
9 OE
10 A8
11 A7
12 A6
13 A5
14 A4
15 A3
16 A2
17 A1
18 A0
19 RAS
20 WE
21 VSSO
22 VDDO3R
23 VSSI
24 VDDI
25 DQ15
26 DQ14
27 DQ13
28 DQ12
29 DQ11
30 DQ10
31 DQ9
32 DQ8
33 DQ7
34 DQ6
35 DQ5
36 DQ4
37 DQ3
38 DQ2
39 DQ1
40 DQ0
41 VDDO3R
42 VSSO
43 AGND
44 AGND
45 DGND
46 VBTM

Fig. 9-2-11 Pin Layout of EDA IC303

9.2.8 PRE/REC

Although IC901 is originally a 3-channel head amp, this unit uses only two of these channels. In recording, recording signal HSE is input from EDA IC303 to the GCA (Gain Control Amp) inside the PRE/REC IC through pin 7. The GCA receives the recording current adjustment value from the EVR, input through pin 8, and adjusts the recording current according to it. The recording current is then sent through the REC amps and output at pins 29 and 31 toward the recording head.

In playback, the PB signal from the head is sent through Q903 and Q907, and input to this IC through pins 24 and 36. After the head switching by HSW, the signal is sent through the 3rd amp and output at pin 61, input to the AGC amp through pin 62, and finally output at pin 64 toward PV IQ IC304 on the DV MAIN board. The output from pin 57 is for use by the ATF but is also supplied to PB IQ IC304, where the ATF signal is extracted. The output at pin 59 is sent to the jig connector as the ENV OUT signal.



RCTL
HID3
HID2
HID1
PBH
RECI
RCUR
RECR
HA2DET
HA2FB
HA2ACFB
PBSW2
HA2IN
VCC3V
MON2IN
GND
48
47
46
45
44
43
42
41
40
39
38
37
36
35
34
33
STAB
PBEN
MMC
INSRH
EQHLD
ENVDET
ENVOUT
TRICKH
ATFOUT
ENVCTL
HAOUT
VCC3V
PBOUT
AGCIN
GND
AGCOUT
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
LOGIC
ENV DET
MONITOR
3rd AMP
LPF
AGC DET
AGC AMP
GCA
HA2
HSW
VREF
HA3
RA2
RA1
HA1
RA3
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
PBH2
RA2OUT
VCC5V
RA1OUT
PBH1
GND
MON1IN
VCC3V
HA1IN
PBSW1
HA1ACFB
HA1FB
HA1DET
VCC5V
RA3OUT
PBH3
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
AGCCTL
AGCDET
VCC3V
RECR1
RECR2
GND
HSE
EVR
HA3DET
HA3FB
HA3ACFB
PBSW3
HA3IN
VCC3V
MON3IN
GND

Fig. 9-2-12 Pin Layout of PRE/REC IC901

9.2.9 PB Equalizer

IC501 is the PB equalizer, which equalizes the waveform of the PB signal in order to correct code errors due to inter-code interference accompanying the magnetic recording/playback of high-density digital signals. The PLL circuit generates the phase-controlled play clock for use in correct recognition of the playback data. A BPF for the ATF signal extraction is also mounted to send the STF signal to EDA IC303. A VCO of the recording clock (41.85 MHz) for use in recording is also provided and outputs signal at pin 31.

PB Equalizer/PLL Circuit

The waveform of the PB signal output from the pre-amp is equalized by PRE-EQ and AUTO-EQ and optimized for decoding. After the 1+D characteristic is added, the signal is output at pin 53 as the 1+D OUT signal to be sent to A/D converter IC305 for viterbi processing. Since the DV uses SI-NRZI modulation, the 1+D OUT signal has an analog waveform with ternary (1, 0, -1) data. It is converted by the A/D converter into a 7-bit digital signal and input to the viterbi circuit in EDA IC303. The digitized ternary data is subjected to highly accurate code error correction based on viterbi detection, and converted by the ternary-binary converter into binary (1, 0) PB data.

The 1+D OUT signal is also output at pin 56. It is passed through the buffer of Q501 and Q503, input again through pin 55, subjected to ternary value detection and binary conversion by the DATA DET circuit using the conventional fixed threshold method, and output at pin 33 as PB DATA. This becomes the PB data when the viterbi circuit is off. However, as the viterbi circuit is permanently working with this unit, this occurs only when the viterbi circuit is forced off by the service adjustment software. It is used in the inherent error rate checking without viterbi detection.

The PB CLK is permanently subjected to phase comparison with the PB data by the PLL circuit, so it is always output in synchronism with the PB data. One of the PB CLK outputs is output at pin 36 as A/D CLK and supplied to A/D converter IC305 for viterbi processing. Another output becomes PB CLK supplied to the EDA IC303. As the sampling points vary when A/D conversion based on AD CLK is performed, it is required to execute sampling at the correct position so that the viterbi detection circuit can function normally. To ensure this, the viterbi circuit outputs the phase correction information at pin 73 as the CK PHASE signal for use in fine phase adjustment by PS (Phase Shift) in the PLL circuit. For the error rate adjustment, the adjustment data from EVR IC503 is converted from serial to parallel then input to the adjustment points. First adjust the VCO voltage to the specified value, then perform the PB EQ adjustments by adjusting of the other adjustment points in the specified order to minimize the error rate.

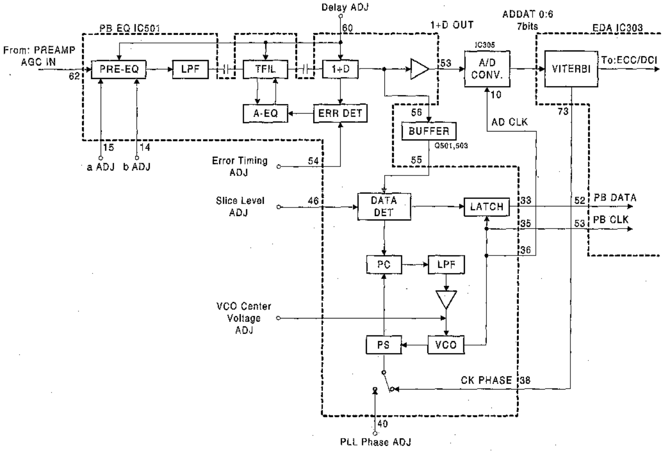

Delay ADJ
60
PB EQ IC501
1+D OUT
ADDAT 0:6
7bits
EDA IC303
From: PREAMP
AGC IN
62
PRE-EQ
LPF
TFIL
1+D
53
IC305
A/D
CONV.
VITERBI
To:ECC/DCI
10
73
A-EQ
ERR DET
56
AD CLK
BUFFER
Q501,503
15
14
a ADJ
b ADJ
Error Timing
ADJ
54
55
Slice Level
ADJ
46
DATA
DET
LATCH
33
52
PB DATA
35
53
PB CLK
36
PC
LPF
VCO Center
Voltage
ADJ
PS
VCO
CK PHASE
38
40
PLL Phase ADJ

Fig. 9-2-13 Configuration of PB EQ Block

9.2.10 DV Interface

(1) IEEE1394

The IEEE1394 data transfer handles both the sync data that should be sent periodically (isochronous data transfer) and the unsynchronous data that can be sent or received at any desired time (unsynchronous data transfer). When transferring data that should be real time such as video and audio signals, data would be lost and the video or audio would be interrupted during the transfer unless communication at constant time intervals is not guaranteed. The isochronous data transfer is capable of real-time data transfer because it reserves the necessary bandwidth for transfer in advance and sends packets every 125 µs (8000 times per sec.).

IEEE1394 defines three data rates of 98.304 Mbps (S100), 196.608 Mbps (S200) and 393.216 Mbps (S400). By defining that a device capable of a high rate should also support a slower rate than this, upward compatibility is provided.

The bus is constructed so that multiple devices (up to 63 components) can communicate between each other without switching the cable and be connected without turning the power off (hot swapping). When the devices are connected, the bus is initialized to form a tree structure in which one of the devices is the root and the others are the branches or twigs of the tree, then the IDs of the devices are assigned automatically (see Fig. 9-2-14).

As seen below, IEEE1394 features a higher degree of freedom in connection than the SCSI standard and the automation of associated settings.

The IEEE1394 standard cable has 6 pins including a pair of power lines and 2 pairs of signal lines, but by excluding a pair of power lines the DV terminal (DV cable) is more compact and has only 4 pins. The maximum length of the DV cable is 4.0 meters and the compatible rate is 100 Mbps (S100) (see 9.4.2, "DV Terminal").

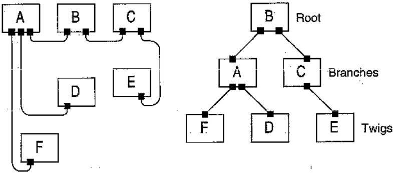
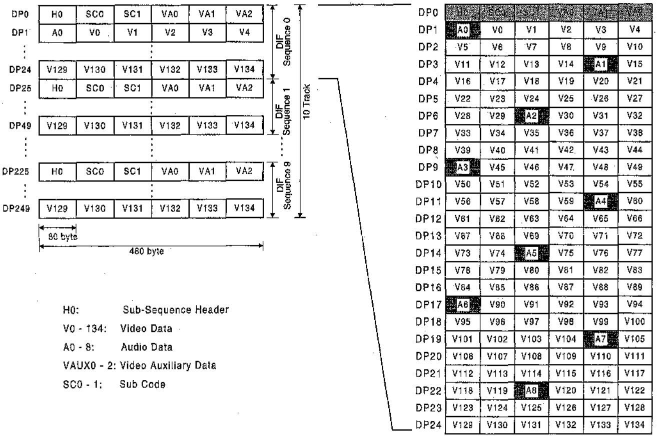


Fig. 9-2-14 Configuration of IEEE1394

(2) AV Protocol

The AV protocol is the format for transferring the digital video signal using the isochronous communication of IEEE1394. As the digital video standard defines that audio and video signal data should be transferred as arrays of 80-byte block data called the DIF blocks, the isochronous communication with packet transfer at every 125µs should send six DIF blocks per packet. As a result, the data of a video frame is transferred in 250 packets.

A total of 150 blocks, including 1 header block, 135 video data blocks, 9 audio data blocks, 3 video auxiliary data blocks and 2 sub-code data blocks in 25 packets from a single DIF sequence, which corresponds to the data of a track on DV tape. With NTSC, 10 tracks of data correspond to 1 video frame.


DP0
H0
SC0
SC1
VA0
VA1
VA2
DP1
A0
V0
V1
V2
V3
V4
DP24
V129
V130
V131
V132
V133
V134
DIF Sequence 0
DP25
H0
SC0
SC1
VA0
VA1
VA2
DP49
V129
V130
V131
V132
V133
V134
DIF Sequence 1
10 Track
DP225
H0
SC0
SC1
VA0
VA1
VA2
DP249
V129
V130
V131
V132
V133
V134
DIF Sequence 9
80 byte
480 byte

DP0	H0	SC0	SC1	VA0	VA1	VA2
DP1	A0	V0	V1	V2	V3	V4
DP2	V5	V6	V7	V8	V9	V10
DP3	V11	V12	V13	V14	A1	V15
DP4	V16	V17	V18	V19	V20	V21
DP5	V22	V23	V24	V25	V26	V27
DP6	V28	V29	A2	V30	V31	V32
DP7	V33	V34	V35	V36	V37	V38
DP8	V39	V40	V41	V42	V43	V44
DP9	A3	V45	V46	V47	V48	V49
DP10	V50	V51	V52	V53	V54	V55
DP11	V56	V57	V58	V59	A4	V60
DP12	V61	V62	V63	V64	V65	V66
DP13	V67	V68	V69	V70	V71	V72
DP14	V73	V74	A5	V75	V76	V77
DP15	V78	V79	V80	V81	V82	V83
DP16	V84	V85	V86	V87	V88	V89
DP17	A6	V90	V91	V92	V93	V94
DP18	V95	V96	V97	V98	V99	V100
DP19	V101	V102	V103	V104	A7	V105
DP20	V106	V107	V108	V109	V110	V111
DP21	V112	V113	V114	V115	V116	V117
DP22	V118	V119	A8	V120	V121	V122
DP23	V123	V124	V125	V126	V127	V128
DP24	V129	V130	V131	V132	V133	V134

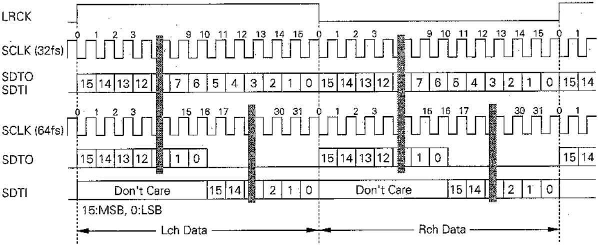
H0:	Sub-Sequence Header
V0 - 134:	Video Data
A0 - 8:	Audio Data
VAUX0 - 2:	Video Auxiliary Data
SC0 - 1:	Sub Code

Fig. 9-2-15 Data of One Video Frame (NTSC)

9.2.11 Audio A/D and D/A

IC201 (AK4518) is a 16-bit A/D & D/A converter IC. The A/D converter functions in recording and the D/A converter functions in playback.

To reduce the power consumption, the IC has the facility of shutting down any A/D or D/A converter that is not used.
The audio data is input and output through pins SDT1 and SDT0 according to SCLK and LRCK. Fig. 9-2-20 shows the data format.



LRCK
SCLK (32fs)
0 1 2 3 9 10 11 12 13 14 15 0 1 2 3 9 10 11 12 13 14 15 0 1
SDTO
SDTI
15 14 13 12 7 6 5 4 3 2 1 0 15 14 13 12 7 6 5 4 3 2 1 0 15 14
SCLK (64fs)
0 1 2 3 15 16 17 30 31 0 1 2 3 15 16 17 30 31 0 1
SDTO
15 14 13 12 1 0 15 14 13 12 1 0 15 14
SDTI
Don't Care 15 14 2 1 0 Don't Care 15 14 2 1 0
15:MSB, 0:LSB
Lch Data
Rch Data

Fig. 9-2-20 Audio Interface Timing (fs = 48 kHz)

<table>
<tr><th>Pin No.</th><th>Label</th><th>In/Out</th><th>Description</th></tr>
<tr><td>1</td><td>VRDA</td><td>In</td><td>Voltage Reference Input for DAC, VA</td></tr>
<tr><td>2</td><td>VRAD</td><td>In</td><td>Voltage Reference Input for ADC, VA</td></tr>
<tr><td>3</td><td>AINR</td><td>In</td><td>Analog Input (R-CH)</td></tr>
<tr><td>4</td><td>VCMR</td><td>Out</td><td>R-Ch Common Voltage Output</td></tr>
<tr><td>5</td><td>VCML</td><td>Out</td><td>L-Ch Common Voltage Output</td></tr>
<tr><td>6</td><td>AINL</td><td>In</td><td>Analog Input (L-CH)</td></tr>
<tr><td>7</td><td>PWAD</td><td>In</td><td>ADC Power-Down Mode "L" : Powe down</td></tr>
<tr><td>8</td><td>PWDA</td><td>In</td><td>DAC Power-Down Mode "L" : Powe down</td></tr>
<tr><td>9</td><td>MCLK</td><td>In</td><td>Master Clock Input</td></tr>
<tr><td>10</td><td>LRCK</td><td>In</td><td>L/R CH Clock Input</td></tr>
<tr><td>11</td><td>SCLK</td><td>In</td><td>Audio Serial Data Clock Input</td></tr>
<tr><td>12</td><td>SDTO</td><td>Out</td><td>Audio Serial Data Output</td></tr>
<tr><td>13</td><td>DGND</td><td>–</td><td>Digital GND</td></tr>
<tr><td>14</td><td>VD</td><td>–</td><td>Digital Power Inputl</td></tr>
<tr><td>15</td><td>SDTI</td><td>In</td><td>Audio Serial Data Input</td></tr>
<tr><td>16</td><td>CMODE</td><td>In</td><td>Master Clock Select Input
"H": 384 fs or 512 fs, "L": 256 fs.</td></tr>
<tr><td>17</td><td>DEM1</td><td>In</td><td rowspan="2">De-emphasis filter switching
<table>
<tr><th>DEM1</th><th>DEM2</th><th>MODE</th></tr>
<tr><td>0</td><td>0</td><td>44.1kHz</td></tr>
<tr><td>0</td><td>1</td><td>OFF</td></tr>
<tr><td>1</td><td>0</td><td>48kHz</td></tr>
<tr><td>1</td><td>1</td><td>32kHz</td></tr>
</table></td></tr>
<tr><td>18</td><td>DEM0</td><td>In</td></tr>
<tr><td>19</td><td>AOUTL</td><td>Out</td><td>Analog Output (L-CH)</td></tr>
<tr><td>20</td><td>AOUTR</td><td>Out</td><td>Analog Output (R-CH)</td></tr>
<tr><td>21</td><td>VCOM</td><td>Out</td><td>Common Voltage Output</td></tr>
<tr><td>22</td><td>AGND</td><td>–</td><td>Analog GND</td></tr>
<tr><td>23</td><td>VB</td><td>–</td><td>Substrate</td></tr>
<tr><td>24</td><td>VA</td><td>–</td><td>Analog Power</td></tr>
</table>

Fig. 9-2-21 IC201 Pin Function Table

9.2.12 Audio Circuit (Audio/LCD Board)

(1) Limiter/ALC circuit

BA3314F (IC206, IC207) on the Audio/LCD board is a dual amp incorporating ALC circuitry. This unit uses only one of the amplifiers. The audio signal input through pin 2 is sent through the limiter (ALC) amp and output at pin 12. Pin 14 is the ALC filter, and either the limiter or ALC operation can be selected by varying the externally connected time constant. The limiter/ALC operations are switched by changing the time constant by turning transistors Q203 and Q204 ON and OFF.

The bases of these transistors are connected to limiter switches S203 and S204.

(2) Limiter/ALC characteristics

The operational characteristics and attack/recovery time of the limiter/ALC are as shown below. The limiter is activated at reference input of +15 dB while the ALC is activated at the reference level.

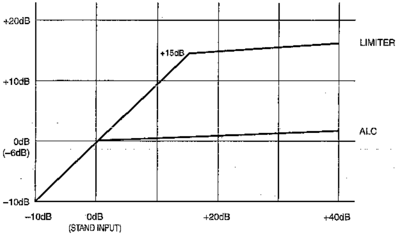


Fig. 9-2-22 Limiter/ALC Operation Characteristic

	Attack time	Recovery time
ALC	Approx. 50 ms	Approx. 10ms.
Limiter	Approx. 10 ms	Approx. 5ms.

Table 9-2-4

(3) **Operation matrix**

Input		AUTO/MANUAL Switch	Operation
LINE	+4dBs	AUTO	ALC ON
		MANUAL	ALC/LIMITER OFF
	–60dBs	AUTO	ALC ON
		MANUAL	LIMITER ON
CAMERA		AUTO	ALC ON
		MANUAL	LIMITER ON

Table 9-2-5

1. Motor Bracket Assembly, Rotary Encoder Assembly

(1) Motor bracket assembly [M6-20]

The motor bracket assembly is composed of a mode control motor and worm gear. It drives the rotary encoder assembly [M6-21] by means of worm wheel 2 [M6-3].

The mode control motor controls the mechanism mode transition (loading/unloading) and selection. The motor ON/OFF status and rotation direction are controlled by the MSD CPU (DV MAIN IC401). The rotation of the mode control motor is transmitted through worm wheel 2 to the switchboard of the rotary encoder for detection and changing of mechanism mode.

(2) Rotary encoder assembly [M6-21]

The rotary encoder assembly is composed of a switch and gear. The rotation angle of the gear is detected from the ON/OFF status of the switch. The ON/OFF status of the switch is in accordance with the mechanism mode, and the information is transmitted to the MSD CPU. The MSD CPU detects the mechanism mode based on this information and controls the mode control motor, drum and capstan motor. The gear of the rotary encoder is also used to transmit the rotation of the mode control motor to the main cam and sub-cam.

(3) Main cam [M6-8]

The main cam controls the supply and take-up loading mechanism. The control groove on the bottom surface of the main cam controls the arm gear 1 assembly [M6-25] and centering arm assembly [M6-26]. The arm gear 1 assembly controls the loading/unloading of the guide roller by controlling the loading gear. The centering arm assembly controls the swinging of the swing arm assembly [M6-42].

The groove on the top surface of the main cam controls the brake control arm assembly [M6-31] and tension control arm assembly [M6-30]. The brake control arm assembly controls the main brake assemblies (SP, TU) [M6-38, 37] and sub-brake assembly [M6-36], and the tension control arm assembly controls the tension arm sub-assembly [M6-40] and band arm plate sub-assembly (tension band) [M6-41].

(4) Sub-cam [M6-9]

The sub-cam controls the loading mechanism on the take-up side. The control groove on the bottom surface of the sub-cam controls the arm gear 2 assembly [M6-27] and clutch lock lever assembly [M-28]. The arm gear 2 assembly controls the exit guide arm assembly [M6-43] and the clutch lock lever assembly controls the clutch lock gears 1 and 2 [M6-12, 14] through the base plate assembly [M6-32].

The control groove on the top surface of the sub-cam controls the charge arm assembly [M6-29]. The charge arm assembly controls the pinch roller arm assembly [M6-44].

2. Tension Arm Sub-Assembly, Reel Brake Operation

(1) Tension arm sub-assembly [M6-40]

The tension arm control arm assembly [M6-30] is controlled from the control groove on the main cam and controls the tension arm sub-assembly. The tension arm sub-assembly has the band arm plate sub-assembly (tension band) [M6-41] attached to it for use in controlling the back tension of the tape.

(2) Main brake assembly (SUP) [M6-38]

The main brake assembly (SUP) is controlled by the brake control arm assembly and used to apply the disk brake of the supply reel so that the tape is not slackened during standby mode after it has been taken out of the cassette. It also applies back tension during FF to avoid slack winding.

(3) Main brake assembly (TU) [M6-37]

The main brake assembly (TU) is controlled by the brake control arm assembly and used to apply the disk brake of the take-up reel so that the tape is not slackened during standby mode after it has been taken out of the cassette. It also applies back tension during REW to avoid slack winding.

(4) Sub-brake assembly [M6-36]

The sub-brake assembly is controlled by the brake control arm assembly and used to apply the disk brake of the take-up reel so that the tape is not slackened during a reverse search.

3. Tape Drive Operations

The rotation of the capstan motor is transmitted through the reel drive pulley assembly [M6-33] and timing belt [M6-11] and finally to the center gear assembly [M6-34].

(1) Center gear assembly

The center gear assembly has a clutch mechanism and controls the tape winding force. The clutch mechanism is not the felt contact type used with VHS recorders but is of the magnetic, non-contact type mechanism. The magnetic clutch features stable performance because it is less sensitive to temperature and humidity than the felt-based clutches. When the magnetic clutch mechanism is worn, the winding force increases, which is an opposite effect to that of the felt-based clutch mechanisms.

(2) Clutch lock gears (1, 2) [M6-12, 14]

The clutch lock gears (1, 2) are controlled by the clutch lock lever assembly. They function as the accelerator mechanism during FF/REW to increase the operation speed.

(3) Swing arm assembly [M6-42]

The swing arm assembly swings under the control of the centering arm assembly [M6-26], and functions to wind tape on the SUP/TU reel disk by transmitting the rotation force of the center gear assembly.

(4) Pinch roller arm assembly [M6-44]

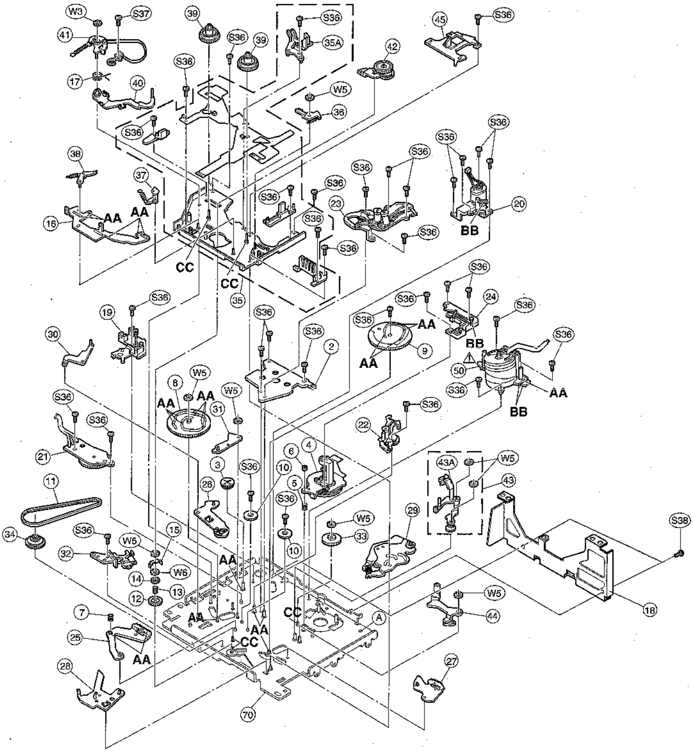
The pinch roller arm assembly is controlled by the charge arm assembly [M6-26] and functions to keep the tape in tight contact with the capstan.

(5) Exit guide arm assembly [M6-43]

The exit guide arm assembly is controlled by the arm gear 2 assembly [M6-27] and functions to regulate the tape drawn from the TU reel and the tape transport. The exit guide arm assembly has a mechanical head cleaner installed on it for cleaning the head during loading or unloading.

Mechanism Layout

- Mechanism explowed view M6 (for reference)


W3
S37
39
S36
39
S36
35A
S36
45
41
42
S36
17
40
W5
36
S36
S36
S36
38
S36
37
S36
S36
S36
23
20
16
AA
AA
S36
BB
S36
CC
CC
35
S36
S36
24
S36
19
S36
S36
30
AA
S36
2
9
AA
S36
50
8
W5
AA
AA
W5
S36
AA
31
BB
S36
S36
22
21
6
4
3
S36
10
43A
W5
11
26
5
43
S36
29
W5
33
S38
34
S36
W5
15
10
32
AA
14
W6
13
12
AA
CC
A
W5
7
AA
44
18
25
CC
AA
28
27
70

9.3.3 Mechanism Operations

1. Outline

The mechanism mode is changed according to the rotation of the mode control motor. The mode change is managed by the MSD CPU, which detects the mechanism mode from the 3-bit signal sent from the rotary encoder assembly. The mechanism used with this unit has 7 mechanism modes (positions).

2. Mechanism Modes

For detailed operation timing of major parts in each mode, see the Mechanism Timing Chart.

(1) Assembly mode

This mode is used in the mechanism assembly. Before starting disassembly or assembly of the mechanism, set it to this mode. As the mechanism is usually in the C-IN mode when no tape is loaded, it can be put into the assembly mode by applying 3 V DC to the electrode of the mode control motor. See Chapter 2, "Mechanism Adjustments" for details.

(2) C-IN mode

The mechanism is in this mode when the cassette has been inserted or ejected. After an eject operation, the mechanism stands by in this mode until the next time a cassette is loaded.

(3) Short FF mode

This mode is activated when the beginning of a tape is detected. In this mode, the mechanism feeds tape in the FWD direction at about double speed until the tape beginning detection signal is canceled. This mode is positioned between the C-IN mode and STANDBY ON (STOP) mode, and the mechanism feeds tape in the FWD direction to remove tape slack.

(4) PLAY/REC/FWD/STANDBY ON mode

These modes occur during playback or recording, as well as during forward search (pinch roller on, max. about 10X speed) which is initiated by pressing the FF button during playback. The mechanism usually stands by in this position in the STANDBY ON (STOP) mode, but enters the STANDBY OFF mode according to the long pause setting. The mechanism can be set to enter the STANDBY ON mode in any of the following cases.

1) When a cassette is loaded: The mechanism mode changes from C-IN to STANDBY ON automatically.
2) When the STOP button is pressed in PLAY, REC, FWD, REV, FF or REW mode.
3) When the beginning of the tape is detected during REW or REV.

(5) REV mode

The mechanism enters this mode when reverse search (pinch roller on, max. about 10X speed) is started by pressing the REW button during playback. In addition, when the mechanism mode changes from C-IN to STANDBY ON (STOP) after a cassette has been loaded, the mechanism also enters this mode automatically during a few seconds of reverse search for the tape winding diameter detection.

(6) STANDBY OFF (STOP) mode

The mechanism is in this mode when the mechanism with tape loaded stands by after a long pause setting period has elapsed or when the power is OFF.

(7) FF/REW mode

The mechanism is in this mode during FF or REW (pinch roller off). The tape is transported at about 13X speed in FF and about 20X speed in REW.

9.3.4 Operation of Active Head Cleaner

The STILL or REC PAUSE mode is canceled in 30 minutes (at above 10°C) or 3 minutes (at below 10°C). However, this time count is reset when the active head cleaner is turned on. The active head cleaner operation stops when the mode changes in the middle of cleaning.

- The active head cleaner is activated in the following cases.

1) Every time after a tape has been loaded.
2) In STOP, STILL or REC PAUSE mode after the PLAY or REC has continued for more than 15 minutes.
3) In STOP, STILL or REC PAUSE mode after FWD or REV search has continued for more than 10 minutes.
4) In STOP, STILL or REC PAUSE mode after FF or REW has continued for more than 10 minutes.
5) When STILL has continued for more than 30 minutes (at above 10oC) or 1 minute (at below 10°C).
6) When REC PAUSE has continued for more than 3 minutes (at above 10°C) or 10 minutes (at below 10°C).
7) In STOP, STILL or REC PAUSE mode after the error rate above 2K has continued for 5 seconds or more. (Once the active head cleaner is turned on this reason, it will not turn on again unless the error rate has dropped to below 500 for more than 5 seconds continuously.)
8) When power is turned ON while a cassette is loaded.

Mechanism Timing Chart

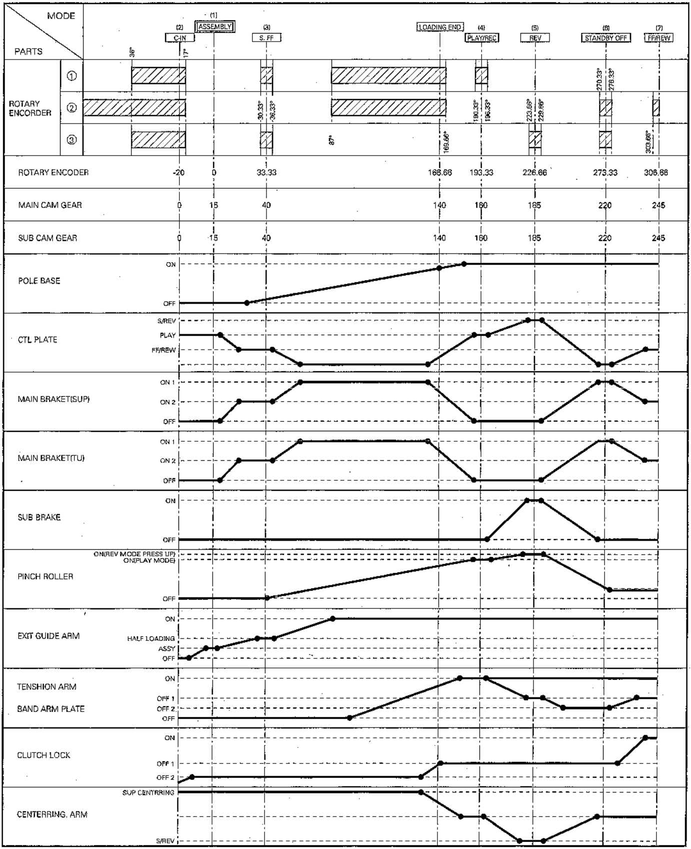

MODE
PARTS
(1) ASSEMBLY
(2) C-IN
(3) S. FF
LOADING END
(4) PLAY/REC
(5) REV
(6) STANDBY OFF
(7) FF/REW
36°
17°
ROTARY ENCORDER
①
②
③
30.33°
36.33°
87°
169.66°
190.33°
196.33°
223.66°
229.66°
270.33°
276.33°
303.66°
ROTARY ENCODER
-20
0
33.33
166.66
193.33
226.66
273.33
306.66
MAIN CAM GEAR
0
15
40
140
160
185
220
245
SUB CAM GEAR
0
15
40
140
160
185
220
245
POLE BASE
ON
OFF
CTL PLATE
S/REV
PLAY
FF/REW
MAIN BRAKET(SUP)
ON 1
ON 2
OFF
MAIN BRAKET(TU)
ON 1
ON 2
OFF
SUB BRAKE
ON
OFF
PINCH ROLLER
ON(REV MODE PRESS UP)
ON(PLAY MODE)
OFF
EXIT GUIDE ARM
ON
HALF LOADING
ASSY
OFF
TENSHION ARM
BAND ARM PLATE
ON
OFF 1
OFF 2
OFF
CLUTCH LOCK
ON
OFF 1
OFF 2
CENTERRING. ARM
SUP CENTERRING
S/REV

Table 9-3-1

9.4 EXPLANATION OF NEW FUNCTIONS

The new functions of the GY-DV500 camcorder are the SSF (Super Scene Finder) and DV terminal. The details of these functions are as described in the following sections.

9.4.1 SSF (Super Scene Finder)

(1) About SSF

The SSF function improves the efficiency of editing by recording the log data (see (3) "About log data" below) required for non-linear editing with the GY-DV500 camcorder in the beginning of each tape during recording. This function has been developed newly for use with professional DV.

(2) Features

The features of SSF are as described below. Thanks to these features, the software built into the camcorder performs all processing without the need of special tape or a processing board.

(a) During recording, stores the log data (for up to 6 cassettes) in the camcorder's EEPROM (Video/SYSCON IC407)

(b) After recording, writes the log data in the sub-code area on the beginning of the tape. As the log data cannot be written once the tape cassette has been ejected, the camera is provided with a memory space for up to 6 cassettes and can transfer log data to a non-linear editing system even after the tape recording has completed.

(c) When the camcorder receives a log data transfer request from the non-linear editing system, the camcorder reads the log data from the tape or EEPROM and transfers it to the non-linear editing system.

(d) The video and audio data according to the log data is also transferred to the non-linear editing system. As the log data of NG (No Good, or unsuccessful) scenes are not stored or transferred, it is easy to eliminate NG scenes later.

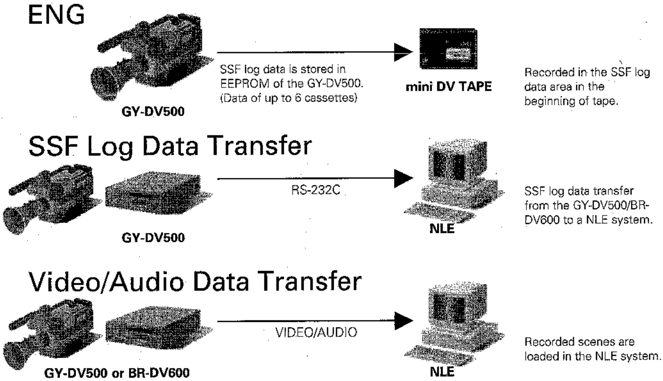

ENG
SSF log data is stored in EEPROM of the GY-DV500. (Data of up to 6 cassettes)
mini DV TAPE
Recorded in the SSF log data area in the beginning of tape.
GY-DV500
SSF Log Data Transfer
RS-232C
NLE
SSF log data transfer from the GY-DV500/BR-DV600 to a NLE system.
GY-DV500
Video/Audio Data Transfer
VIDEO/AUDIO
Recorded scenes are loaded in the NLE system.
GY-DV500 or BR-DV600
NLE

Fig. 9-4-1

(3) About log data

The SSF creates the following 5 items of log data during recording.

(a) Cassette number

(b) Scene number

(c) IN time code data (MI)

(d) OUT time code data (MO)

(e) CUE time code data (CUE).

Each of these data items is as described below.

(a) Cassette number

The cassette number is assigned automatically during recording, and the number is recorded continuously in the sub-code area of tape during recording. The cassette number begins with 1 and increments automatically with every cassette. The maximum count is 9999 and after this the number returns to 1. As the cassette number also includes the model discrimination ID code (S.S.F. ID : memorized on IC407(EEPROM) of VIDEO/SYSCON board.) of the recorder, overlapping with a cassette recorded with another GY-DV500 unit will hardly ever occur.

(b) Scene number

The scene number begins with 1 and increments automatically with every scene. The scene number of each scene is recorded in the sub-code area during recording of the scene. The maximum count is 119 and the subsequent scenes cannot be numbered (the VF shows "M : – – –" in this case).

(c) IN time code data

Indicates the time code of the start point of a scene.

(d) OUT time code data

Indicates the time code of the end point of a scene.

(e) CUE time code data

Indicates the time code of the point where the TAKE button is pressed during recording in CUE mode.

(4) MARK mode and CUE mode

The SSF has two operation modes of MARK and CUE. The log data is registered in either mode.

(a) MARK mode

Pressing the TAKE button on the camcorder body registers IN time code data, and pressing the button again registers OUT time code data. GY-DV500 can be registered 119 scene maxmum.

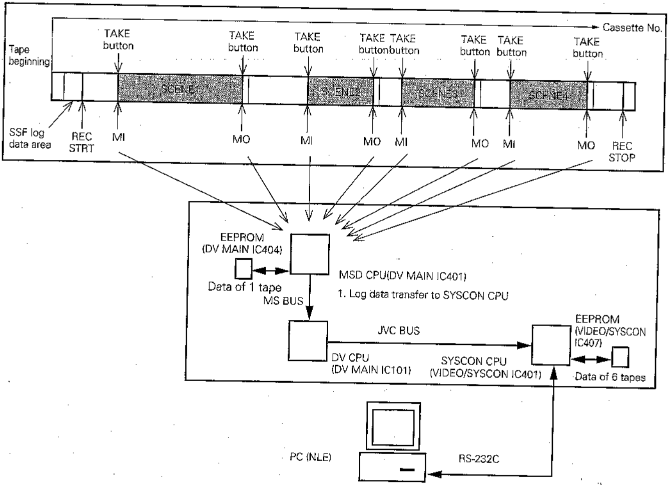
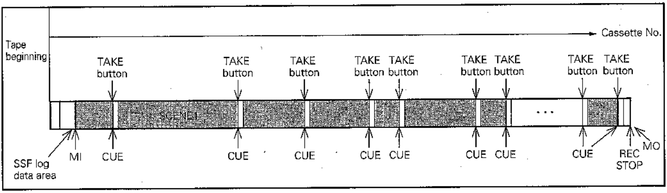

Cassette No.
Tape beginning
TAKE button
TAKE button
TAKE button
TAKE button
TAKE button
TAKE button
TAKE button
TAKE button
SCENE1
SCENE2
SCENE3
SCENE4
SSF log data area
REC STRT
MI
MO
MI
MO
MI
MO
MI
MO
REC STOP
EEPROM (DV MAIN IC404)
Data of 1 tape
MSD CPU(DV MAIN IC401)
1. Log data transfer to SYSCON CPU
MS BUS
JVC BUS
EEPROM (VIDEO/SYSCON IC407)
DV CPU (DV MAIN IC101)
SYSCON CPU (VIDEO/SYSCON IC401)
Data of 6 tapes
PC (NLE)
RS-232C

Fig. 9-4-2 Example of MARK Mode

(b) CUE mode

The IN time code data is registered at the same time as the start of recording, the OUT time code data is registered at the same time as the end, and the CUE time code data is registered every time the TAKE button is pressed during the recording. GY-DV500 can be registered 237 CUE point maxmum.



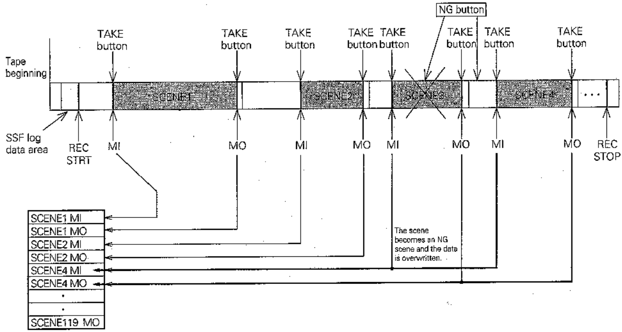
Cassette No.
Tape beginning
TAKE button
TAKE button
TAKE button
TAKE button TAKE button
TAKE button TAKE button
TAKE button TAKE button
SCENE1
. . .
SSF log data area
MI
CUE
CUE
CUE
CUE CUE
CUE CUE
CUE
REC STOP
MO

Fig. 9-4-3 Example of CUE Mode

(5) NG button and CONTINUE button

(a) NG button

The NG button is used to delete a registered scene or IN time code data from the log data as the NG (No Good, or unsuccessful) scene at the mark mode. Although the log data is deleted, the recorded video signal remains intact on tape. The log data of the scene registered by this operation overwrites the log data of the next scene. The next scene is renumbered by regarding a the NG scene as a scene without a number. Since the upper limit of the scene number is 119, the number of recordable scenes decreases if the NG button is pressed frequently. If the NG button is pressed to cancel all recording after registration of the OUT time code data, the log data of the last scene remains as the log data of an OK scene when the log data is written in the cassette.



NG button
TAKE button
TAKE button
TAKE button
TAKE button TAKE button
TAKE button TAKE button
TAKE button
Tape beginning
SCENE1
SCENE2
SCENE3
SCENE4
. . .
SSF log data area
REC STRT
MI
MO
MI
MO
MI
MO
MI
MO
REC STOP
SCENE1 MI
SCENE1 MO
SCENE2 MI
SCENE2 MO
SCENE4 MI
SCENE4 MO
•
•
SCENE119 MO
The scene becomes an NG scene and the data is overwritten.

Fig. 9-4-4 Function of NG Button

(b) CONTINUE button

After interrupting recording in the middle to check the previously recorded scenes, pressing the LOG + CONTINUE buttons automatically searches the point after the last recorded scene so that subsequent recording can be started. (Scene end search function)

(6) Storage of Log Data

The camcorder can store the log data of up to 6 video cassettes. The registered log data is recorded in the SSF log data area in the beginning of each tape. However, if tape is rewound every time after recording to record the data, there is a possibility of missing important scenes during ENG, for example. It is to avoid this that the camcorder reserves the storage area for registered log data of up to 6 cassettes. The log data is recorded in EEPROM (DV MAIN IC404) in the VTR unit at the same time as in EEPROM (VIDEO/ SYSCON IC407) in the GY-D500 camcorder body.

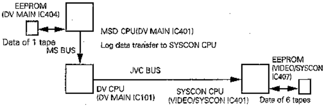


Fig. 9-4-5 Log Data Storage

(7) Recording of Log Data

Log data can be recorded in each cassette only with the method described below. Once the cassette has been ejected, it is no longer possible to write log data in it.

- Recording method

  To write log data in the cassette immediately after completion of recording, press the LOG + REW buttons simultaneously. If it is required to restart recording after the log data recording, press the LOG + CONTINUE buttons simultaneously in STOP mode; the recorder will automatically advance tape to the recording end point (OUT time code point) and stands by in REC PAUSE mode.

(8) Transfer of SSF log data

The SSF log data can be transferred to a non-linear editing system in the following methods.

(A) Required equipment

- Insert the cassette tape to the GY-DV500.
- GY-DV500 used in recording and cassette tape.
- Non-linear editor

(B) Transfer procedure

- GY-DV500 receives a SSF log data transfer request from the non-linear editor.
- In the GY-DV500, the cassette number of the SSF log data that is stored in the memory of the camera and the cassette number that is registered in the loaded cassette are compared. If they are found to match, the SSF log data is transferred to the non- linear editor.
- When the cassette number is not matched, display of the non-linear editer shows the "INVALID ERROR".

(9) Transfer of Video/Audio Data

The non-linear editor back-captures the video and audio data based on the log data transferred as described in (8) "Transfer of SSF Log Data". Three pieces of equipment are required for this operation, including the cassette used in recording, a non-linear editor and a VCR with SSF function (GY-DV500 or BY-DV600).

The non-linear editor captures the video and audio data by controlling the camcorder according to the SSF log data. At this time, the camcorder detects if the number of the cassette being loaded matches the cassette number indicated by the SSF log data, and transfers the data if they coincide and returns INVALID ERROR if they do not.

9.4.2 DV Terminal

(1) Outline

The DV terminal is a terminal capable of input and output of information including video, audio and data codes in digital form.

By connecting another digital video component equipped with a DV terminal to the camcorder using a DV cable, digital dubbing (in any direction) with little deterioration in video and audio quality is possible without A/D or D/A conversion between components.

When a PC equipped with a DV terminal (i. Link compliant) is connected directly through a DV cable, the video recorded with the camera can be loaded in the PC (provided that the circuitry and software of the PC are capable of handling the DV signal).

As the DV terminal can also send or receive camera control command data information, the camcorder operations such as start and stop can be remote controlled by connecting a piece of non-linear equipment and a camcorder or VCR equipped with a DV terminal. (However, in this case, the control software of the connected non-linear equipment should be IEEE1394 compliant.)

(2) About IEEE1394

This is an interface for the next generation of machines for use in high-speed data transfer between PC and ancillary equipment and was adopted officially as an IEEE standard in 1995.

It uses the serial transfer method and accepts up to 63 pieces of equipment. The transfer rates are as high as 100, 200 or 400 Mbps and suitable for transfer of moving images and audio data.

To transfer such data in priority, IEEE1394 is provided with the isochronous transfer function. It is therefore confidently expected to become a transfer standard for multimedia.

The connector types include the ordinary 6-pin type and a compact 4-pin type with which the power and GND lines are omitted. The DV camcorders usually use compact 4-pin type connectors.

(3) About DV Terminal

The "DV terminal" is the term used by the general public to indicate "IEEE1394-1995 Specifications and Their Extended Specifications (usually called IEEE1394)", which are high-speed serial interface specifications for connection between a PC and ancillary equipment or audio/visual equipment. Note that the IEEE1394 interface specifications themselves have not been designed exclusively for digital video interfacing.

The "DV terminal" is a connector in accordance with the i. Link (IEEE1394) Specifications but it is exclusively designed for use with DV equipment. (It uses a 4-pin connector and the transfer rate is 100 Mbps.)

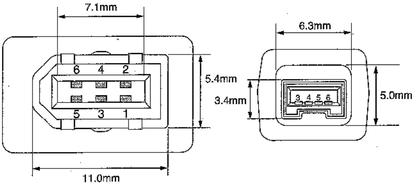
"i. Link" is a registered trademark of Sony Corporation indicating IEEE1394-1995 and its extended use.

Therefore, the digital data exchanged through the interface called the DV terminal is the video data compressed according to the DV standard, and the data can be transferred between DV equipment or between DV equipment and a PC which runs software handling the DV signal (DV Non-Linear, etc.) and is equipped with a DV terminal. In other words, with a piece of equipment handling different formats of video data (a D-VHS machine, for example), it is not possible to monitor or dub video even if the equipment is equipped with a DV terminal.

(4) DV Terminal Used with This Unit

This unit is a camcorder incorporating a DV standard recorder. As a logical consequence, the data sent or received by it is the DV signal, compatible with DV standard VCRs such as the consumer-use DV Movie, and can be subjected to digital dubbing or editing/processing by a DV non-linear PC.

It is also possible to remote control the recorder operations of this unit from a PC or similar device running DV non-linear software.



1. Power
2. GND

3. 4. } Signal line A

5. 6. } Signal line B

Fig. 9-4-6

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